State of California

THE RESOURCES AGENCY

Department of Water Resources

BULLETIN No. 115

YUBA AND BEAR RIVERS BASIN INVESTIGATION

Appendix I: Marysville Reservoir Operation Studies

AUGUST 1965

HUGO FISHER
Administrator
The Resources Agency

EDMUND G. BROWN
Governor
State of California

WILLIAM E. WARNE
Director
Department of Water Resources

This monument in Marysville serves as a reminder of the ever present flood danger from the tricky Yuba River. Marysville Reservoir will provide flood protection for Marysville, Yuba City, and lands along the lower Yuba.

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WILLIAM E. WARNE, *Director*

June 11, 1965

Honorable Edmund G. Brown, Governor
and Members of the Legislature
of the State of California

Gentlemen:

I have the honor to transmit Appendix I to Bulletin No. 115, "Yuba and Bear Rivers Basin Investigation". This appendix, "Marysville Reservoir Operation Studies", presents an analysis of the yield potential of Marysville Reservoir for a gross storage capacity of one million acre-feet.

Although not listed in Bulletin No. 115 as a forthcoming appendix, the analysis presented is the culmination of studies initiated during the course of the basinwide investigation. The yield potential as presented herein is a further refinement of the yield figure shown in the main bulletin.

The results of this yield study will permit refinement of economic analyses of Marysville Reservoir as a potential export project to meet the growing demands for water within the State.

Sincerely yours,

William E. Warne

Director

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

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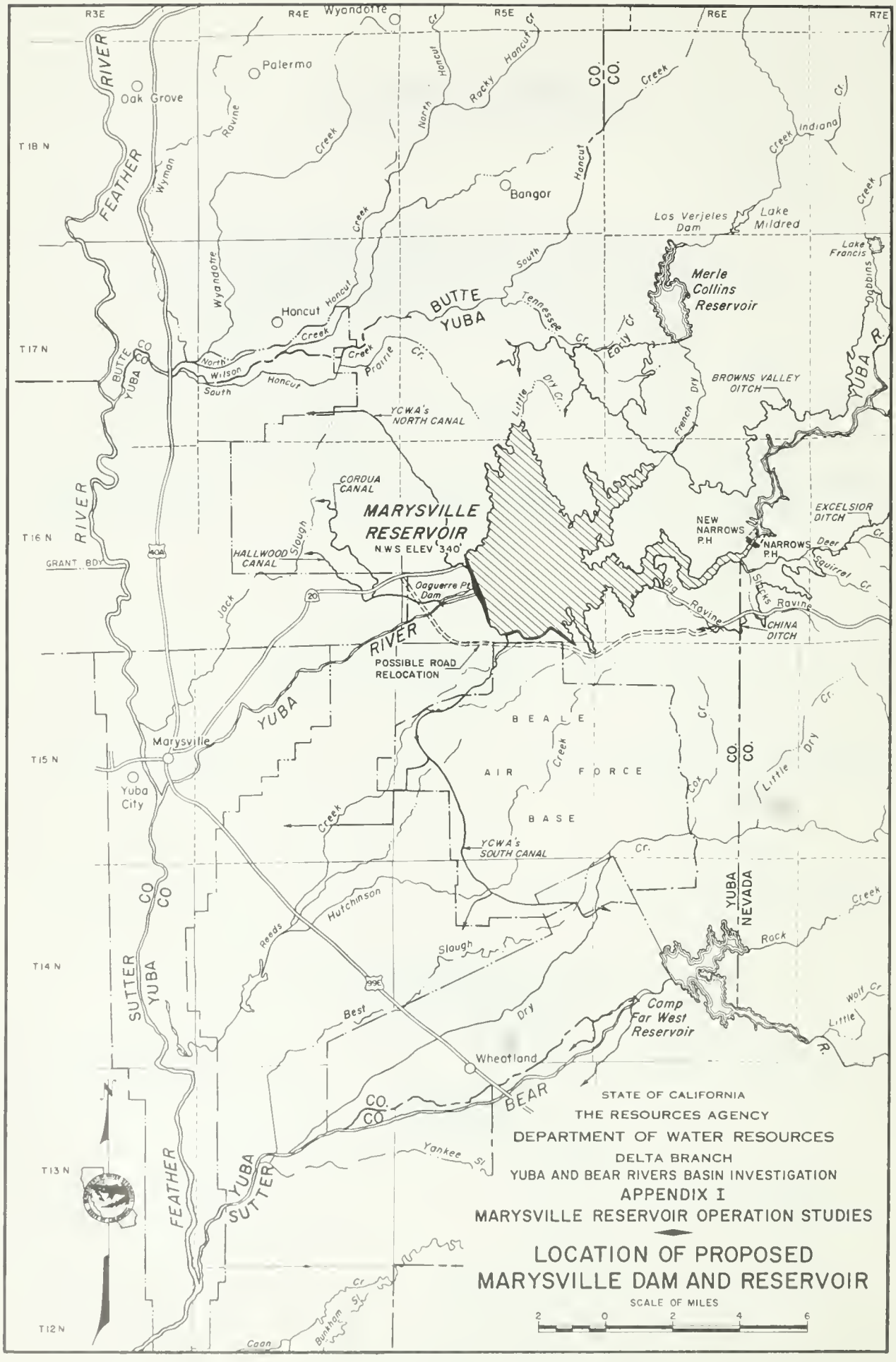
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CORDUA CANAL
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NWS ELEV 340'
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NARROWS P.H
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CHINA DITCH
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GRANT BDY
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THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DELTA BRANCH
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INTRODUCTION

As pointed out in Bulletin No. 115, "Yuba and Bear Rivers Basin Investigation", the New Bullards Bar-Marysville Project is considered to be the most practical multipurpose plan to maximize the development and utilization of the water resources of the lower Yuba River. In Chapter V of this bulletin, it is shown that the New Bullards Bar Unit will develop new water supplies adequate to meet all future supplemental consumptive requirements of adjacent valley floor lands considered to be dependent upon the Yuba River as the most likely source of future water supplies.

The new yield which could be developed by Marysville Reservoir would therefore be entirely in excess of local needs and would be available for export to areas of deficiency.

Recent studies by the Department show that the State Water Project can supply anticipated demands for irrigation, municipal and industrial water in areas under existing water supply contracts until the mid-1980's.

Additional facilities will be required after the mid-1980's to satisfy further demands for water, which in areas served by the State Water Project alone, are expected to increase by about 1,000,000 acre-feet by 1995. At the same time, surplus flows in the Sacramento-San Joaquin Delta, which make up a portion of the project yield, will diminish as the result of additional development and use of water in the area tributary to the Delta. Therefore, additional future water supplies must be made available not only to meet export demands, but to offset

depletions resulting from increased upstream water use in areas and counties of origin.

The proposed Marysville Reservoir possesses the potential to satisfy a portion of these future demands. The purpose of the studies leading to this appendix was to determine the magnitude of this potential.

The study described in this appendix considers a Marysville Reservoir of 1,000,000 acre-foot gross storage capacity, operated separately to sustain the yield of the State Water Facilities. No attempt was made to integrate the operation of Marysville Reservoir with other units of the State Water Project or the federal Central Valley Project.

During the Yuba and Bear Rivers Basin Investigation, consideration was given to including hydroelectric power generating facilities with the Marysville Project. However, based upon analysis of a peaking plant operated at 30 percent annual capacity factor and using alternative values for power obtainable with modern fossil fuel steam plants, justification of a power installation below the dam was found to be marginal. Furthermore, the value of power in the not too distant future is expected to be even lower with the advent of large nuclear plants presently planned for construction. For this reason, power facilities were not incorporated in the project outlined in this report.

There are additional considerations which tend to detract from the desirability of a power development in connection with the Marysville Project. These were not evaluated in the previous analysis. First, there would be an increase in the temperature of water released to the river due to warming in an afterbay which would be required for the reregulation of

power releases. The Department of Fish and Game is greatly concerned about the temperature of water which would be released from Marysville Reservoir (see Appendix B of Bulletin No. 115). The depth of water in an afterbay of 50,000 acre-foot capacity constructed immediately below the dam would average about 30 feet when full. With a surface area of about 2,400 acres, considerable warming of the water would result.

Inclusion of power facilities would also decrease the yield from the Marysville Project. There are several reasons for this. First, there would be evaporation from the afterbay. Using the same evaporation rate as that utilized for the main reservoir, project evaporation losses from the afterbay would be about 7,200 acre-feet per year. Second, it would be necessary to release water from the reservoir for power generating purposes during the winter months when adequate flows were available in the Delta to satisfy water requirements in the state service area. This would also decrease the project yield.

In summary, the water release temperatures would be minimized, and the economic return and water yield from the project would be increased if power facilities were not included.

Discussions of project water supply, operational considerations and limitations, and an evaluation of the project yield are presented in the following sections of this appendix.

WATER SUPPLY

The water supply available to the Marysville Reservoir will be the natural flow of the Yuba River and French Dry Creek at the damsite, as impaired and modified by upstream developments. Present impairments to the natural flow result from the use of water for irrigation, urban and domestic purposes; export of water from the Yuba River Basin; and evaporation from upstream reservoirs. Impairment to the natural water supply from these causes will increase in the future when projects presently under construction and those proposed for future construction are in operation. In addition to streamflow impairments, the flow regimen is presently modified by operation of existing reservoirs to meet irrigation and hydroelectric power demands, and will be further modified by projects constructed in the future.

The Marysville Reservoir Project was analyzed on the basis of net inflow expected in 1995. Studies leading to the plan for development presented in Bulletin No. 115 indicate that there will be only slight additional impairment to the inflow after that date. Works assumed to be in operation in 1995 are listed below and are shown on Plate 6 of Bulletin No. 115.

North Yuba River - Slate Creek Diversion
New Bullards Bar Reservoir and powerplants
Browns Valley Ditch

Middle Yuba River - Jackson Meadows Reservoir
Milton Diversion
Hour House Diversion
Log Cabin Diversion

South Yuba River	-	Bowman and all upstream reservoirs Bowman-Spaulding Conduit Texas-Fall Creek System Spaulding and all upstream reservoirs Excelsior Ditch
Yuba River	-	Englebright Reservoir and powerplants
Deer Creek	-	Cascade and Snow Mountain Ditches Enlarged Scotts Flat Reservoir and downstream canals Bitney Corner Reservoir and downstream canals
French Dry Creek	-	Imports per OWID-YCWD 1958 agreement 1/ New York Flat Reservoir (first stage development) Virginia Ranch Project

Streamflow Impairment and Modification

Impairment and modification to the natural flow at the Marysville damsite was based on the proposed or assumed operating schemes of the above listed works.

The greatest effect on the inflow to Marysville Reservoir will be caused by the proposed Yuba River Development of the Yuba County Water Agency (YCWA). The Agency's New Bullards Bar Reservoir affords full regulation of the North Yuba River when analyzed through the historical critical dry period of 1928 through 1934 and considerably modifies the flow regimen of the stream during normal and wet years. The proposed method of operating the Yuba River Development was formulated by International Engineering Company, Incorporated, (IECO) and is presented in

1/ See page 200, Bulletin No. 115

a report by that company on the Yuba River Development entitled, "Definitive Reservoir Operation and Power Study", dated March 1963.

Impairments and the net water supply available to this development are discussed in the above report and in a previous report prepared by IECO for the YCWA entitled, "Report on Development of Water Resources of the Yuba River", dated January 1961. Appendix A of the 1961 IECO report describes future streamflow impairments to the YCWA project. Impairments considered by IECO are listed below by stream.

North Yuba River	- Exports via Oroville-Wyandotte Irrigation District's Slate Creek Diversion as estimated by the Pacific Gas & Electric Co. - Export of 2,500 acre-feet annually via Browns Valley Ditch.
Middle Yuba River	- The total natural runoff of the Middle Yuba River above Milton Diversion Dam, less stream maintenance flows of 3 second-feet all year.
South Yuba River	- The total natural runoff of the South Yuba River above Washington gaging station, plus the available flow at the Excelsior Ditch intake up to 7,500 acre-feet per month, April through October of each year.
Deer Creek	- The total natural runoff of Deer Creek above Scotts Flat Dam.
French Dry Creek	- The total natural runoff of French Dry Creek above Virginia Ranch Dam, less spills from the reservoir operation.

The above listed impairments give a conservative estimate of the water supply available to the YCWA project and assure the maintenance

of a dependable power output during the project repayment period should a critical dry period such as 1928-34 recur. The contract for the sale of hydroelectric power from the YCWA project will require that a minimum power output be maintained through the most adverse period of water supply. Marysville Reservoir, on the other hand, will be operated mainly as a flood control and water development project. Therefore, Marysville Reservoir will have a greater operational flexibility than the YCWA project. Accordingly, the following modification to the assumptions of impairments considered by IECO were made.

North Yuba River	-	None
Middle Yuba River	-	None
South Yuba River	-	Inflow to Marysville Reservoir was increased by (1) natural accretions between Washington, Bowman, and Lang Crossing gages as impaired by diversions from Texas and Fall Creeks to Bowman-Spaulding Canal, and (2) spills from Spaulding Reservoir. Spills at Bowman Dam are minor and are not included. Diversions to Excelsior Ditch were assumed to be zero. Consumptive use of water delivered via Excelsior Ditch was estimated to be balanced by return flow to Deer Creek resulting from irrigation in the Deer Creek watershed. (See Deer Creek below.) Unconsumed diversions return to the Yuba River above Marysville damsite.
Yuba River	-	Main stem accretions between Narrows Dam and Marysville damsite, not considered by IECO, were included as inflow.
Deer Creek	-	Department studies were utilized to determine the contribution to inflow

from Deer Creek. Impairments to the natural flow of Deer Creek at the mouth are based on a DWR operation study of Cascade and Snow Mountain Ditches, Enlarged Scotts Flat Reservoir, proposed Bitney Corner Reservoir, and irrigation diversions below these reservoirs. Return flow to Deer Creek was neglected. (See South Yuba River above.) Accretions below Bitney Corner damsite were computed by area-precipitation ratio to be 12 percent of the natural flow at the Deer Creek gage.

French Dry Creek - Impairments to the natural flow at the mouth is based on a DWR operation study of New York Flat and Virginia Ranch Projects.

The resulting monthly quantities of impaired inflow to Marysville Reservoir under assumed 1995 conditions of upstream development are shown in Table I-1. The natural flows used for this tabulation are those which historically occurred during the period 1921-41. The natural flows which were used in the determination of the quantities shown in columns 2 and 9 of Table I-1 are presented in Tables I-2 through I-8.

Reservoir Evaporation

The net evaporation rate from Marysville Reservoir during an average year is estimated to aggregate 3.0 feet. This rate is similar to that currently being utilized by the Department for Oroville Reservoir, and is corrected for the net gains from precipitation due to the change in land use in the reservoir area.

The estimated net rate per month for the combined effects of evaporation and precipitation at Marysville Reservoir is as follows:

Month	Net evaporation rate in feet
January	-0.15
February	0.00
March	0.00
April	0.20
May	0.40
June	0.65
July	0.80
August	0.70
September	0.50
October	0.30
November	-0.10
December	-0.30
TOTAL	3.00

OPERATIONAL CONSIDERATIONS AND LIMITATIONS

Factors which will govern the operation of Marysville Reservoir include those relating to prior rights to the waters entering the reservoir, requirements for the preservation of fishlife, the occurrence of dry years, flood control requirements, and the potential demand for water conserved by the project. Each of these factors is discussed below.

Local Water Requirements and Water Rights

Marysville Dam would be located downstream from the proposed Yuba County Water Agency's Yuba River Development, construction of which may begin in 1965. Releases to satisfy downstream water rights would be made from the reservoir in the amounts which will be provided from the Agency's project. Also releases in the amount of 5,000 acre-feet per month would be made from Marysville Reservoir to allow for percolation losses in the lower Yuba River channel.

Releases would also be made directly from the reservoir to satisfy the rights of Browns Valley Irrigation District and the Yuba County Water Agency. The Browns Valley Irrigation District diversions would be made in accordance with the proposal of that agency to pump 14,500 acre-feet per year from the Yuba River above Daguerre Point Dam to serve lower elevation lands in the district. Further details on this proposal are presented in Chapter V of Bulletin No. 115. Deliveries to the YCWA would be made in the amounts shown in the IECO report "Definitive Reservoir Operation and Power Study". Releases required to meet local requirements and water rights are shown in Tables I-9 and I-10.

Fishery Requirements

Minimum fish releases for the lower Yuba River, to be provided by the Yuba County Water Agency's Project, are specified in a schedule jointly adopted by the Department of Fish and Game and the YCWA.

Minimum fish release requirements are:

400 second-feet	October 1 to January 1
245 second-feet	January 1 to July 1
70 second-feet	July 1 to October 1

During dry years, reduction in releases would be made in accordance with a curtailment schedule included in the agreement.

As the result of more refined studies performed subsequent to the agreement with the YCWA, the Department of Fish and Game has recommended that after construction of Marysville Reservoir, a revised maintenance release schedule be employed. Major increases in flow are recommended for the months of January, February, and July. The revised minimum release schedule for fishery maintenance purposes recommended by the Department of Fish and Game as shown in Appendix B of Bulletin No. 115 is:

400 second-feet	October 1 to March 1
250 second-feet	March 1 to August 1
70 second-feet	August 1 to October 1

It should be recognized that although the additional releases are deemed necessary for the maintenance of more satisfactory minimum flow conditions for the salmon run which would be established by the YCWA Project, these flows can only be considered as an enhancement which would be made possible by the construction of Marysville Reservoir.

Project yield figures shown in this report were determined using the increased fishery maintenance flows recommended by the Department of Fish and Game. No economic analysis was made to determine if these additional releases can be justified.

If augmented fish releases cannot be economically justified, and the schedule approved by the YCWA is used, an increase in project yield of about 18,000 acre-feet per annum can be realized at the level of development expected in 1985. This value would gradually reduce to about 8,000 acre-feet per annum by the year 2035.

Dry Years

Criteria established for the YCWA Project modifying local irrigation deliveries and releases to be made for fish during years of extremely low runoff were followed in this study.

Prediction of spring and summer runoff of Sierra Nevada streams can be made with a high degree of accuracy by means of surveys made of the mountain snowpack. After April 1, the forecast of runoff for the balance of the water year is usually within plus or minus five percent of the quantity which actually occurs. Criteria for adjustment of releases during dry years can therefore be related to the April 1 forecast with a reasonable assurance of conformance with estimates.

The agreement between the Department of Fish and Game and the YCWA provides for a reduction in the required releases for fishlife to the lower Yuba River in the event of a critical dry year. A critical dry year, as defined therein, is a water year for which the April 1

forecast of the Department of Water Resources predicts that basin runoff above Smartville will be 50 percent or less of normal. The critical dry year provisions will be determined at the time the April 1 forecast is available and will continue until the April forecast of the following year. The water release curtailment schedule for critical dry years would begin on May 1. The schedule is as follows:

Streamflow forecast of Yuba River at Smartville in percent of normal	Reduction in water release for fishlife in percent
Above 50	0
46 - 50	15
41 - 45	20
40 or less	30

Reductions which would have taken place under flow conditions experienced during the period 1920-21 through 1940-41 are shown in Table I-11.

Reduction in deliveries for irrigation use established by IECO in connection with their "Definitive Reservoir Operation and Power Study", are as follows:

Streamflow forecast in percent of normal	Reduction in irrigation deliveries with power operation at 34 percent annual capacity factor in percent
Above 85	0
51 - 85	10
50 or less	20

Resulting dry year reductions are reflected in releases made from Narrows Powerplants, shown in Column 1 of Table I-1. Deliveries to the YCWA service area from Marysville Reservoir would not change as the result of the construction of the Marysville Project.

Flood Control Requirements

The Corps of Engineers has established the criteria for operation of flood control reservoirs on the Yuba River. These are discussed in Chapter IV of Bulletin No. 115. Monthly flood control storage reservations used in this study are based on the diagrams shown on Figure 1, page 124. The monthly flood control storage reservations were determined on the basis of a single main-stem reservoir and reduced by about 80 percent of the space provided in the New Bullards Bar Reservoir up to the maximum of 170,000 acre-feet. These reservations are shown in Table I-12 of this report.

Storable Inflow to Marysville Reservoir

Storage of water in a reservoir can be made only to the extent that there is unappropriated water available as inflow. In the case of streams in the Central Valley of California, appropriation for consumptive use is possible up to the point where the water enters San Francisco Bay. Recent permits issued by the State Water Rights Board on streams with hydraulic continuity with the Sacramento-San Joaquin Delta and with a place of water use outside of the Sacramento River Basin and the Delta, prohibit diversions from streamflow during the months of July through September. In other words, it is the Board's opinion that the entire July through September flow of all streams tributary to the Delta is required to satisfy existing rights in the Sacramento River Basin and the Delta. Therefore, surplus flows are considered to be available only during the balance of the year. Storage of inflow to Marysville Reservoir must accordingly be limited to periods of surplus flow in the Delta.

The occurrence and magnitude of surplus flows in the Delta under future conditions of development were determined by operation studies conducted by the Department of Water Resources. These studies utilize historic conditions of runoff which include the 20 years from 1921 through 1940. This period includes the critical dry period 1928 through 1934 as well as the preceding and following wet periods. These studies were made using projections of future conditions of upstream development anticipated at the midpoint of each decade. Operation of existing 1/ water development facilities over the historical water supply period provides the basis for determining the availability of surplus water in the Delta under the conditions assumed.

The yield of Marysville Reservoir was determined for anticipated conditions of consumptive use in the Central Valley for a period from 1985 to the year 2035. Surplus water in the Delta anticipated in 1995 is shown in Table I-12. Inspection of this table will reveal that, when using historic conditions of water supply, surplus water would occur in only 12 months during the critical operational period for the State Water Project (April 1928 through October 1934 under criteria presently being utilized). The portion of these amounts contributed by the Yuba River would be available for storage in Marysville Reservoir.

1/ Current studies also include the estimated effect of Yuba County Water Agency's Yuba River Development, Placer County Water Agency's Middle Fork American River Project, and Sacramento Municipal Utility District's American River Development.

PROJECT YIELD EVALUATION

In the following sections, the methods, criteria, and assumptions used in arriving at the export yield creditable to Marysville Reservoir are discussed. All values of yield are based on providing a firm new water supply to the state service area with no deficiencies in dry years.

Export Releases

As explained in the introduction, Marysville Reservoir was analyzed from the standpoint of sustaining the yield of the State Water Project. Basically, the yield obtainable from the State Water Project will result from (1) the use of surplus flows appropriated at the Delta, and (2) releases from the Oroville facilities. The surplus flows and Oroville releases would be pumped from the Delta for conveyance to the State Water Project service area or to temporary holdover storage in San Luis Reservoir.

Pumping requirements at the Delta Pumping Plant will be high during the winter months when surplus flows are available in the Delta. During these months, the canal to San Luis Reservoir will be operated at maximum capacity during offpeak pumping periods. Consequently, any additional water released to the Delta would waste to the Pacific Ocean, or require more costly pumping during the onpeak periods. Therefore, water releases from Marysville Reservoir were scheduled during the summer months when conduit capacity is available and pumping can be limited to offpeak periods.

In evaluating project yield, releases for export purposes during the critical period were assumed to occur on a usable schedule in

months of no surplus in the Delta. Where additional fish maintenance releases are provided as recommended by the Department of Fish and Game in Appendix B, these flows were incorporated into the release schedule and credited to export supply if occurrence was during nonsurplus periods. An illustrative example of Marysville Reservoir operated in this manner is shown in Table I-12.

Operating Assumptions and Criteria

The basic assumption made in evaluating the yield potential of Marysville Reservoir is that the reservoir would be operated in conjunction with surplus flows in the Delta which will remain after operation of the federal Central Valley Project (CVP) and the State Water Project (SWP) to support annual diversion requirements of 13,560,000 acre-feet per annum as defined in the May 16, 1960 agreement 1/. No attempt was made to operate the reservoir conjunctively with the Oroville facilities although some additional yield could probably be realized under such a scheme.

Additional assumptions and criteria which form the basis for determining the new yield which could be developed by the project are as follows:

Basic Assumptions Relating to Marysville Reservoir

1. Inflow to Marysville Reservoir will be as impaired by the level of development anticipated in 1995.

1/ "Agreement Between the United States of America and the Department of Water Resources of the State of California for the Coordinated Operation of the Federal Central Valley Project and the State Feather River and Delta Diversion Projects", dated May 16, 1960.

2. Releases from Marysville Reservoir to satisfy local requirements will be at least equal to amounts that will be provided by Yuba County Water Agency in operation of their proposed Yuba River Development. (See Tables 1-9 and 1-10.)

3. Augmented fish releases will be provided as recommended by the Department of Fish and Game. (See previous section under heading of "Fishery Requirements" for details.)

4. The project will be operated for flood control in accordance with U.S.E.D. criteria.

5. Inactive storage capacity will be 200,000 acre-feet. (This is a tentative figure pending results of future fishery studies.)

Criteria Presently Utilized for the Combined Operation of the Federal Central Valley Project and State Water Project

The following criteria are presently being utilized by the Department in studies of the State Water Project. The criteria assumes the CVP and the SWP as operating concurrently but separately. It should be recognized that this method of operation does not produce the maximum benefits from the two projects. However, until negotiations with the U. S. Bureau of Reclamation concerning the agreement on operating criteria are completed, it is necessary to consider the two projects operating in this manner.

The major elements of the operating criteria are:

1. The Oroville-Thermalito Facilities will be operated to provide flood control on the Feather River; to provide a new water supply for contractors in the Feather River service area in addition to meeting the existing water rights; to provide additional water for diversion from the Sacramento-San Joaquin Delta by the California Aqueduct; to supply 710 megawatts of dependable electrical power; and for use in connection with recreation and the fish resources of the Feather River.

2. The federal Central Valley Project would be operated similar to the method shown in the USBR's water right exhibit 164 entitled, "Central Valley Project Operation Study, Shasta Reservoir Operation, Exhibit 164".

3. The Central Valley Project and State Water Project would be operated to support the diversion requirement shown in the May 16, 1960 agreement.

4. The State's canal capacity to San Luis will be 10,000 second-feet. Surplus capacity in the Bureau's Delta-Mendota Canal will also be utilized.

5. The State's pumping from the Delta would be permitted during periods of onpeak demand for power, but only to the extent that the maximum onpeak pumping rate would not exceed 8,200 second-feet.

6. Pumping into San Luis Reservoir will be limited to periods of offpeak demand for power.

7. Allowable deficiencies in the agricultural portion of the yield to be provided from the Central Valley Project and State Water Project, when operated under historical water supply conditions, will be incurred in the amount of 50 percent in 1931 and 50 percent in 1934.

A more detailed discussion of this criteria and the method of operation of the CVP and SWP is presented in Bulletin No. 132-64, Chapter VII.

Surplus Flows in the Delta

1. Surplus flows utilized in the Marysville Reservoir Operation Studies are those resulting from operation of the CVP-SWP under the above criteria and conditions.

2. Present surplus flows in the Delta will be reduced on the basis of estimates of future increases in consumptive uses in the watershed tributary to the Delta.

Project Yield

Figure I-1 shows the new firm yield which could be made available for export from the Sacramento-San Joaquin Delta as a result of constructing Marysville Reservoir. The reduction in annual yield from about

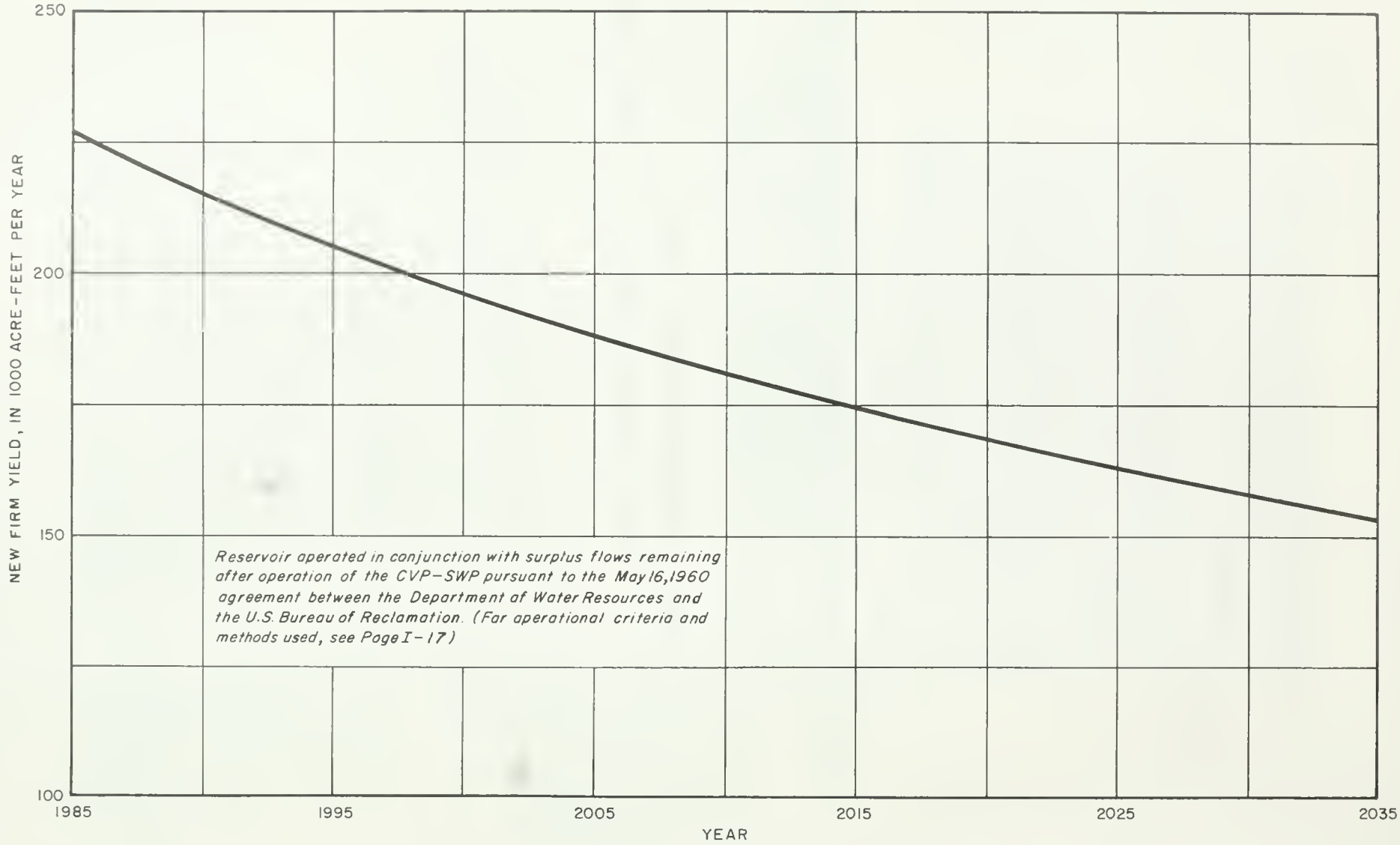

Figure I-1. YIELD CONTRIBUTION OF MARYSVILLE RESERVOIR TO THE STATE WATER PROJECT

225,000 acre-feet per annum in 1985 to 155,000 acre-feet in 2035 results from the decreased quantities of surplus flows in the Delta available to satisfy a portion of the annual SWP demands. The reduction of surplus flows in the Delta is based on Department estimates of increased consumptive use of water in areas and counties or origin.

A monthly operation study of Marysville Reservoir for the period 1921-40 is presented in Table I-12. This study illustrates possible releases from the reservoir operated in conjunction with surplus flows in the Delta and San Luis Reservoir. Water surface levels corresponding to monthly storage amounts from this study are shown on Figure I-2. The period of main recreation use has been superimposed on this figure to illustrate the relatively small fluctuations of the reservoir pool during the recreation season in all but the extremely dry period.

There are many unknowns yet to be resolved before a final yield figure for Marysville Reservoir can be established. Perhaps the largest unknown factor relates to the important salmon fishery in the lower Yuba River. A comprehensive study of the salmon fishery of the lower Yuba River as affected by the Marysville Reservoir Project is planned by the Department of Fish and Game and the U. S. Fish and Wildlife Service. This study will be funded by the constructing agency after project authorization, and will serve to resolve any fishery problems prior to project construction. Included will be a study to predict the temperature of flows released from the reservoir. The desirability of improved spawning areas below the dam will also be evaluated. As noted in Appendix B of Bulletin No. 115, improvement of spawning areas would require larger winter releases from the reservoir.

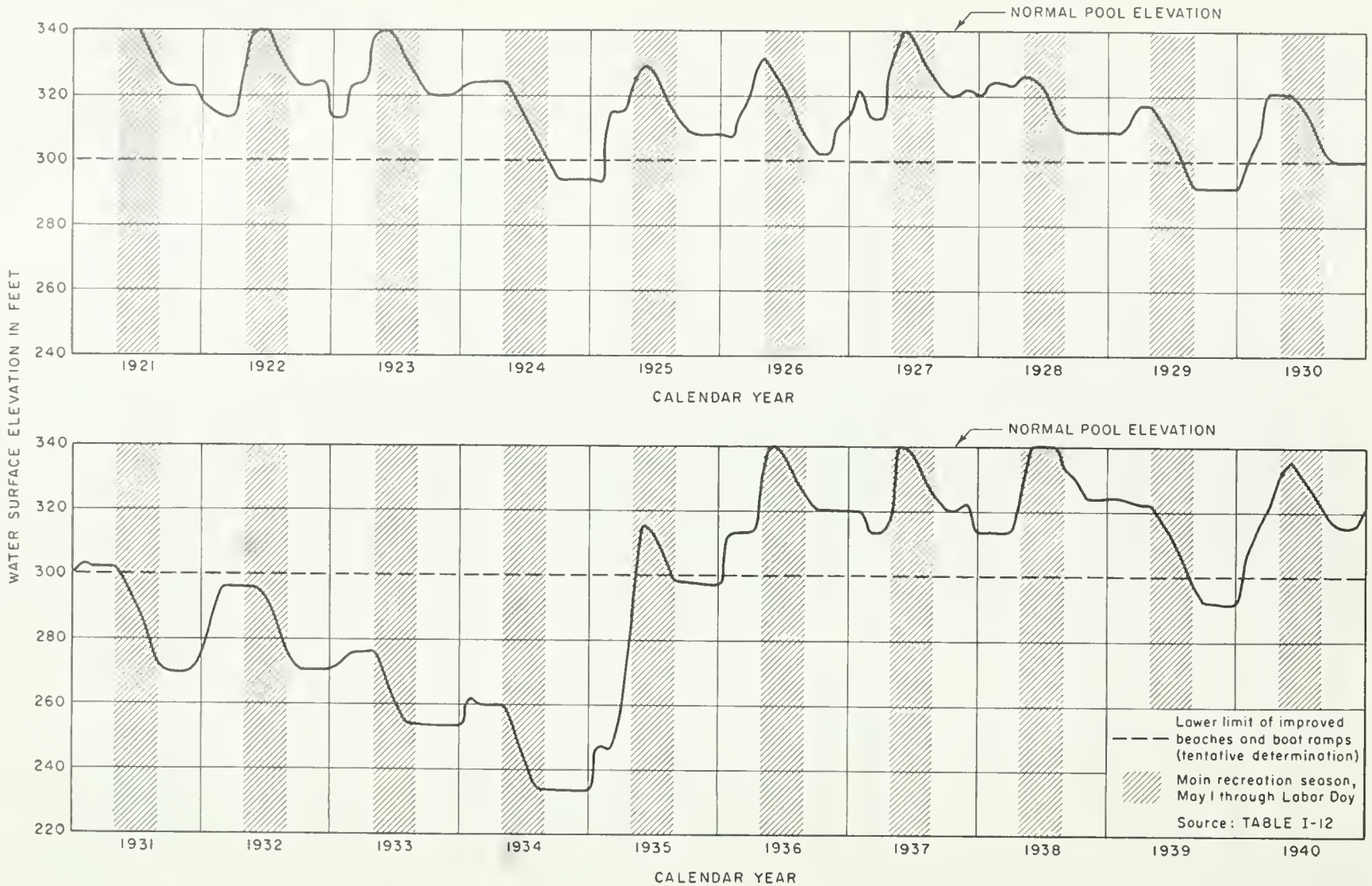

Figure I-2. MARYSVILLE RESERVOIR WATER SURFACE LEVELS

Minimum pool requirements should also be evaluated. An additional 16,000 acre-feet per annum of firm yield would be realized if dead storage in the reservoir could be reduced to 100,000 acre-feet during critically dry periods.

Future studies by the Department and negotiations with the U. S. Bureau of Reclamation on coordinated operation of the CVP and the SWP will undoubtedly result in modification of the criteria and assumptions utilized as the basis for yield studies made for this report. As these events take place, it will be possible to more firmly establish the amount of export yield creditable to Marysville Reservoir.

Any further studies by the Department should also include consideration of storing additional inflow in Marysville Reservoir in lieu of pumping this water from the Delta into San Luis Reservoir. This type of operation would minimize pumping into San Luis Reservoir and therefore provide a potential additional economic benefit to the project.

CONCLUSIONS

Analysis of the yield potential of Marysville Reservoir from the standpoint of sustaining the yield of the State Water Project led to the following conclusions:

1. Marysville Reservoir could be operated to provide a firm new water supply for export from the Delta of about 225,000 acre-feet per annum in 1985. (See Figure I-1.) On the same basis, the available yield in the year 2035 would be about 155,000 acre-feet per annum.

2. Marysville Reservoir could be operated to store additional inflow which would otherwise be pumped into San Luis Reservoir. This type of operation would minimize the pumping into San Luis Reservoir and therefore provide a potential additional economic benefit.

3. Operation of the reservoir to develop maximum water yield for export from the Delta would be compatible with requirements for fishery preservation and a high level of reservoir use for recreation purposes.

4. Reduction of the inactive storage capacity of the reservoir from 200,000 to 100,000 acre-feet during a recurrence of the critically dry period would increase the firm export yield of the project by about 16,000 acre-feet annually.

TABLES

TABLE I-1 (1 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman-Spaulding Conduit 2/ - (3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan										
Feb										
Mar										
Apr										
May										
Jun										
Jul	156.2	1.4	1.3		3.9		.2	1.7	.1	162.2
Aug	106.0	1.2	.8		1.9		.1	1.6	0	110.0
Sep	77.9	1.0	.7		2.2		.1	1.3	0	81.8
Oct	51.2	1.0	.4		3.3		.2	.9	.1	56.3
Nov	30.6	1.4	.4		0		.3	.7	.3	32.9
Dec	48.2	4.4	.6		0		1.3	3.2	.7	57.2
Total	(470.1)	(10.4)	(4.2)		(11.3)		(2.2)	(9.4)	(1.2)	(500.4)
Jan	60.2	4.2	.6		0		1.4	4.3	2.4	71.9
Feb	123.5	14.2	1.5		0	4.9	4.5	32.5	5.9	184.0
Mar	212.3	13.2	1.9		0	20.7	3.9	41.2	5.7	295.1
Apr	189.0	21.0	2.7		7.5	13.3	3.1	31.7	2.7	265.6
May	513.8	34.7	15.5	122.5	7.5	12.5	3.4	11.0	2.0	691.9
Jun	428.0	19.3	15.5	102.3	7.5		1.1	2.4	.5	545.6
Jul	197.0	3.1	2.7		7.5		.3	1.8	.1	207.1
Aug	114.6	1.9	.8		3.5		.1	1.6	.1	121.0
Sep	77.8	1.2	.5		2.2		.1	1.3	0	82.1
Oct	51.2	1.3	.6		4.3		.2	.9	.1	57.4
Nov	35.2	3.0	.9		0		.6	1.0	.4	39.3
Dec	102.4	15.6	2.6		0		3.4	7.5	3.9	130.2
Total	2105.0	132.7	45.8	224.8	40.0	51.4	22.1	137.2	23.8	2691.2
Jan	139.6	8.3	1.6		0	3.1	1.7	4.5	2.3	157.9
Feb	104.1	6.1	1.0		0	2.3	1.1	8.5	1.2	122.3
Mar	134.3	7.4	1.6		0	4.9	1.0	9.5	1.2	156.7
Apr	154.3	21.6	4.2	7.1	7.5	5.6	1.5	5.6	1.1	200.1
May	185.2	16.8	8.8	54.6	7.5		0.4	1.5	.2	257.4
Jun	120.2	6.1	5.6	4.8	7.5		.2	1.6	.1	134.9
Jul	164.4	2.1	1.8		3.7		.2	1.7	0	170.3
Aug	110.8	1.5	.7		2.6		.1	1.6	0	115.9
Sep	77.5	1.4	.7		4.3		.1	1.3	.1	84.0
Oct	58.3	1.6	1.1		7.5		.3	1.0	.1	67.7
Nov	34.3	1.5	.5		0		.4	.4	.2	36.3
Dec	37.7	1.9	.5		0		.4	.6	.3	40.4
Total	1320.7	76.3	28.1	66.5	40.6	15.9	7.4	37.8	6.8	1543.9

TABLE I-1 (2 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman-Spaulding Conduit 2/ -(3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	47.8	2.1	.6		0		.4	.7	.4	50.8
Feb	65.8	7.5	1.8		0		1.2	1.5	.9	75.1
Mar	37.8	2.6	1.0		0		.2	.4	.2	40.2
Apr	45.4	6.7	2.2		7.4		.4	1.1	.2	59.0
May	80.8	2.8	1.8		1.5		.1	1.1	0	84.5
Jun	94.5	0.6	.5		1.0		0	1.4	0	97.0
Jul	115.4	0.4	.3		1.2		0	1.6	0	118.3
Aug	96.0	0.8	.5		1.8		0	.7	0	98.8
Sep	74.3	0.8	.5		2.0		0	.1	0	76.7
Oct	68.6	1.2	.4		3.8		.2	.2	.1	73.7
Nov	39.9	3.2	1.3		0		.5	.8	.3	43.4
Dec	30.0	5.4	1.6		0		.9	2.0	1.0	37.7
1924 Total	796.3	34.1	12.5	0	18.7	0	3.9	11.6	3.1	855.2
Jan	64.2	5.6	1.4		0		1.2	3.0	1.6	74.2
Feb	199.5	29.4	5.8		0		5.0	11.1	5.4	244.6
Mar	68.5	10.0	3.4		0		1.1	2.6	1.3	80.1
Apr	86.8	19.4	3.7		7.5	0.3	1.2	2.5	.8	114.8
May	129.4	11.7	6.5	17.8	7.5		.4	1.4	.2	161.9
Jun	111.3	3.3	3.0	1.0	5.1		.2	1.6	.1	119.6
Jul	117.5	1.0	.9		2.1		.1	1.7	0	121.5
Aug	105.9	1.3	.4		2.4		.1	1.6	0	110.9
Sep	77.9	1.2	.4		2.7		.1	1.3	0	82.8
Oct	52.7	1.3	1.0		3.5		.2	.9	0	57.6
Nov	34.4	1.9	1.1		0		.3	.5	.2	36.2
Dec	38.3	2.5	1.9		0		.3	.7	.3	40.2
1925 Total	1086.4	88.6	29.5	18.8	30.8	0.3	10.2	28.9	9.9	1244.4
Jan	53.4	4.1	1.4		0		.6	1.4	.7	58.8
Feb	138.4	16.0	2.1		0		3.0	6.2	3.1	164.6
Mar	149.2	9.0	4.6		0		.9	2.0	1.0	157.5
Apr	191.5	21.1	5.2	13.1	7.5		1.3	2.4	.8	232.5
May	95.0	6.0	2.8	18.1	5.4		.3	1.3	.1	123.4
Jun	112.3	1.2	.8		2.7		.1	1.5	0	117.0
Jul	117.8	.6	.2		1.4		0	1.6	0	121.2
Aug	106.1	.8	.2		1.5		0	1.5	0	109.7
Sep	78.0	.8	.2		1.8		0	1.2	0	81.6
Oct	52.1	1.3	.3		3.1		.1	.9	0	57.2
Nov	87.1	16.9	3.2		0		2.0	3.1	1.5	107.4
Dec	53.6	6.3	3.0		0		.6	1.6	.7	59.8
1926 Total	1234.5	84.1	24.0	31.2	23.4	0	8.9	24.7	7.9	1390.7

TABLE I-1 (3 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman-Spaulding Conduit 2/ - (3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	79.9	9.6	3.2		0		1.9	5.3	2.8	96.3
Feb	570.4	52.1	5.6		0	12.2	7.3	42.9	8.6	687.9
Mar	321.9	20.4	4.2	5.0	0	5.6	2.4	22.8	3.2	377.1
Apr	252.8	29.1	6.4	45.4	7.5	3.3	1.9	8.0	1.5	343.1
May	258.1	18.9	12.2	116.3	7.5		.7	2.0	.3	391.1
Jun	208.6	7.6	6.8	64.0	7.5		.3	1.6	.1	282.9
Jul	166.5	2.0	1.8		3.5		.1	1.7	0	172.0
Aug	107.1	1.4	1.1		2.3		0	1.6	0	111.3
Sep	78.0	1.0	0		2.0		.1	1.2	0	82.3
Oct	51.8	1.1	.6		2.5		0	.9	0	55.7
Nov	43.5	7.0	3.3		0		.9	1.4	.6	50.1
Dec	37.8	4.4	2.5		0		.5	1.3	.6	42.1
1927 Total	2176.4	154.6	47.7	230.7	32.8	21.1	16.1	90.7	17.7	2692.4
Jan	57.1	6.2	.9		0		1.0	2.8	1.5	67.7
Feb	93.3	7.9	3.1		0		1.1	3.0	1.3	103.5
Mar	720.8	56.0	10.6	39.6	0	16.0	5.9	40.4	7.2	875.3
Apr	176.5	19.4	5.7	62.5	7.5	5.2	1.3	4.6	.9	272.2
May	130.2	9.4	8.2	67.6	6.7		.2	1.4	.1	207.4
Jun	112.2	1.9	.5		2.6		.1	1.5	0	117.8
Jul	117.7	0.9	.4		2.0		.1	1.7	0	122.0
Aug	106.0	1.1	.6		1.9		0	1.5	0	109.9
Sep	78.0	0.8	.2		1.7		.1	1.2	0	81.6
Oct	51.7	0.9	0		2.5		.1	.9	0	56.1
Nov	33.2	2.1	.5		0		.3	.4	.1	35.6
Dec	42.1	4.1	0		0		.4	.8	.4	47.8
1928 Total	1718.8	110.7	30.7	169.7	24.9	21.2	10.6	60.2	11.5	2096.9
Jan	45.2	2.3	.3		0		.3	.7	.3	48.5
Feb	55.9	6.6	1.0		0		.9	1.4	.7	64.5
Mar	66.9	7.2	3.3		0		.7	1.8	1.0	74.3
Apr	59.9	10.0	3.6		7.5		1.1	1.8	.6	77.3
May	86.3	10.2	7.5		7.5		.4	1.3	.2	92.1
Jun	102.2	4.3	3.4		7.3		.3	1.3	.1	112.1
Jul	116.0	1.2	.8		3.1		.2	1.4	0	121.1
Aug	98.6	1.1	.3		2.3		0	1.0	0	102.7
Sep	72.9	0.8	0		1.9		0	.8	0	75.4
Oct	52.4	1.0	.2		2.8		0	.1	0	56.1
Nov	29.3	0.7	.3		0		.1	.2	0	30.0
Dec	80.4	13.6	6.6		0		1.9	3.7	1.2	94.9
1929 Total	866.0	59.0	27.3	0	32.4	0	5.9	15.5	4.8	956.3

TABLE I-1 (4 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman Spaulding Conduit 2/ - (3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	73.8	9.5	.8		0		1.4	3.2	1.7	88.8
Feb	74.7	9.7	2.5		0		1.9	4.0	1.9	89.7
Mar	131.0	14.8	2.6		0	0.1	2.8	6.1	3.1	155.3
Apr	124.0	13.3	6.8	15.8	7.5	3.8	.8	2.1	.6	161.1
May	88.2	8.8	5.8	16.4	7.5		.5	1.5	.2	117.3
Jun	105.1	2.6	2.0		3.8		.1	1.5	.1	111.2
Jul	110.9	0.9	.4		2.4		.1	1.6	0	115.5
Aug	98.7	1.0	0		2.1		0	1.5	0	103.3
Sep	72.9	0.8	.7		1.9		.1	1.2	0	76.2
Oct	50.7	0.9	0		3.1		.1	.9	0	55.7
Nov	34.3	2.3	.8		0		.4	.5	.2	36.9
Dec	31.0	1.3	.8		0		.1	.3	.1	32.0
Total	995.3	65.9	23.2	32.2	28.3	3.9	8.3	24.4	7.9	1143.0
Jan	52.3	3.9	.2		0		.6	.9	.5	58.0
Feb	48.0	4.1	.4		0		.5	.8	.4	53.4
Mar	69.2	7.5	.9		0		.8	1.1	.7	78.4
Apr	44.8	5.4	3.8		5.4		.2	.9	.1	53.0
May	80.8	3.4	2.7		2.9		.1	1.0	0	85.5
Jun	94.4	1.3	1.0		2.3		0	1.0	0	98.0
Jul	116.2	0.5	.3		1.6		0	.7	0	118.7
Aug	96.1	0.7	0		1.6		0	.4	0	98.8
Sep	74.4	0.6	.2		1.6		0	.3	0	76.7
Oct	69.3	1.0	.6		3.1		.1	.2	.1	73.2
Nov	41.3	1.9	.2		0		.3	.6	.3	44.2
Dec	40.3	7.1	.5		0		2.0	4.6	2.4	55.9
Total	827.1	37.4	10.8	0	18.5	0	4.6	12.5	4.5	893.8
Jan	76.0	6.3	0.5		0		2.0	5.0	2.7	91.5
Feb	83.0	10.6	1.9		0		2.2	5.3	2.5	101.7
Mar	109.1	14.9	4.1		0	2.7	2.3	6.5	2.9	134.3
Apr	79.0	16.9	5.8		7.5	1.8	1.3	4.0	.9	105.6
May	117.1	20.7	11.8	19.0	7.5	1.0	1.0	2.2	.5	157.2
Jun	123.2	7.4	6.6	37.6	7.5		0.4	1.7	.2	171.4
Jul	154.2	1.6	1.5		4.0		.2	1.7	0	160.2
Aug	105.9	1.3	0		2.8		.1	1.6	0	111.7
Sep	77.8	0.8	.2		2.0		.1	1.3	0	81.8
Oct	52.0	0.9	0		2.8		.1	.8	0	56.6
Nov	29.0	1.2	.5		0		0	.3	.1	30.1
Dec	30.7	1.4	.9		0		.1	.4	.1	31.8
Total	1037.0	84.0	33.8	56.6	34.1	5.5	9.8	30.8	9.9	1233.9

TABLE I-1 (5 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman Spaulding Conduit 2/ - (3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	41.2	1.8	0		0		.2	.6	.2	44.0
Feb	40.5	2.7	.2		0		.3	.8	.3	44.4
Mar	71.7	8.2	1.8		0		2.0	3.8	2.1	86.0
Apr	61.6	11.6	3.4		7.5		1.1	2.0	.7	81.1
May	86.5	12.1	5.9		7.5		1.0	1.7	.5	103.4
Jun	110.4	6.7	6.0	4.0	7.5		.5	1.4	.1	124.6
Jul	113.7	1.3	1.1		3.5		.1	1.2	0	118.7
Aug	98.6	1.0	.4		2.3		.1	1.1	0	102.7
Sep	72.9	0.7	.4		1.9		.1	.9	0	76.1
Oct	51.2	1.2	.2		2.8		.1	.2	0	55.3
Nov	30.2	1.4	1.0		0		.1	.2	0	30.9
Dec	43.7	5.3	1.4		0		.4	.7	.4	49.1
1933 Total	822.2	54.0	21.8	4.0	33.0	0	6.0	14.6	4.3	916.3
Jan	68.8	6.7	1.5		0		.8	1.3	.8	76.9
Feb	72.5	7.4	2.7		0		1.2	1.8	1.0	81.2
Mar	75.8	9.5	5.2		0		.7	1.1	.7	82.6
Apr	44.5	6.4	5.1		6.3		.2	.9	.1	53.3
May	81.6	3.2	2.1		3.1		.1	.9	.1	86.9
Jun	96.4	1.2	.8		1.9		.1	1.1	0	99.9
Jul	113.2	0.6	.4		1.6		0	1.0	0	116.0
Aug	92.7	0.7	0		1.5		0	.6	0	95.5
Sep	70.7	0.6	.4		1.6		0	.2	0	72.7
Oct	63.6	0.7	0		2.3		.1	.2	0	66.9
Nov	37.9	3.3	1.9		0		.6	.9	.4	41.2
Dec	25.0	3.1	1.4		0		.4	1.2	.6	28.9
1934 Total	842.7	43.4	21.5	0	18.3	0	4.2	11.2	3.7	902.0
Jan	76.1	8.6	1.0		0		1.4	4.1	2.2	91.4
Feb	75.3	8.0	1.3		0		1.8	4.8	2.2	90.8
Mar	79.0	9.7	3.2		0		1.8	5.0	2.5	94.8
Apr	171.5	36.6	6.9		7.5	4.3	4.4	10.0	3.6	231.0
May	267.3	18.4	12.2	53.2	7.5	1.3	1.3	2.5	.7	340.0
Jun	175.2	6.3	5.7	30.8	7.5		0	1.6	.1	215.8
Jul	148.5	1.2	.9		3.6		.1	1.7	0	154.2
Aug	105.9	1.1	.9		2.7		0	1.6	0	110.4
Sep	78.0	.9	0		2.5		0	1.2	0	82.6
Oct	51.3	1.0	.5		2.9		.2	.9	0	55.8
Nov	29.2	1.4	.7		0		.1	.4	.1	30.5
Dec	31.7	1.7	.5		0		.1	.6	.2	33.8
1935 Total	1289.0	94.9	33.8	84.0	34.2	5.6	11.2	34.4	11.6	1531.1

TABLE I-1 (6 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Natural accre-tions between Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman Spaulding Conduit 2/ -(3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	133.3	18.6	3.7		0		4.2	9.8	5.2	167.4
Feb	388.0	29.8	3.9		0	18.0	6.5	46.3	6.3	491.0
Mar	257.4	14.7	4.9		0	9.2	1.1	16.3	2.3	296.1
Apr	229.3	22.0	8.9	61.6	7.5	2.9	1.0	3.8	.9	320.1
May	187.6	12.4	11.4	106.5	7.5		.5	1.5	.2	304.8
Jun	122.3	4.4	4.0	36.3	4.8		.3	1.6	.1	165.8
Jul	146.7	1.3	1.2		2.9		.2	1.7	0	151.6
Aug	106.0	1.2	.1		2.5		.1	1.6	0	111.3
Sep	77.9	.9	.7		2.2		.1	1.3	0	81.7
Oct	51.9	.8	0		2.5		.1	.8	0	56.1
Nov	29.0	1.1	0		0		.1	1.1	.1	31.4
Dec	30.8	1.3	1.0		0		.1	2.1	.1	33.4
1936 Total	1760.2	108.5	39.8	204.4	29.9	30.1	14.3	87.9	15.1	2210.7
Jan	40.3	1.4	.2		0		.2	3.2	.2	45.1
Feb	79.5	10.4	1.2		0		2.0	3.7	2.4	96.8
Mar	103.9	13.1	2.6		0		2.7	10.2	3.6	130.9
Apr	186.5	22.6	4.9		7.5	2.6	2.7	7.6	2.1	226.7
May	272.2	19.7	13.2	104.6	7.5	1.9	1.5	2.2	.8	397.2
Jun	114.6	4.3	3.9	2.3	7.5		.3	1.6	.1	126.8
Jul	144.2	1.3	1.2		3.8		.2	1.7	.1	150.1
Aug	105.9	1.2	0		2.9		.1	1.6	0	111.7
Sep	77.8	0.9	0		2.5		.1	1.3	0	82.6
Oct	51.7	1.0	.9		2.6		.1	.9	0	55.4
Nov	38.4	4.1	1.6		0		.6	1.1	.4	43.0
Dec	228.5	21.8	10.2		0		2.2	5.4	2.7	250.4
1937 Total	1443.5	101.8	39.9	106.9	34.3	4.5	12.7	40.5	12.4	1716.7
Jan	102.2	5.9	1.4		0		1.5	4.5	2.3	115.0
Feb	297.6	17.2	2.5		0	5.3	3.6	31.6	4.4	357.2
Mar	545.2	35.4	2.6		0	36.1	7.3	76.5	9.7	707.6
Apr	337.0	31.2	6.5	28.9	7.5	11.6	2.8	14.8	2.2	429.5
May	394.4	30.8	15.5	138.9	7.5	5.5	2.0	4.8	1.0	569.4
Jun	287.1	10.5	9.5	65.9	7.5		.6	1.9	.2	364.2
Jul	187.8	2.3	2.1		5.2		.2	1.7	.1	195.2
Aug	108.0	1.9	.5		3.7		.1	1.6	.1	114.9
Sep	77.7	1.2	.4		3.0		.1	1.3	0	82.9
Oct	51.0	1.6	.5		5.0		.2	.9	.1	58.3
Nov	31.0	2.3	.4		0		.2	.4	.1	33.7
Dec	33.5	2.5	.7		0		.2	.7	.3	36.5
1938 Total	2452.6	142.8	42.6	233.7	39.4	58.5	18.8	140.7	20.5	3064.4

TABLE I-1 (7 of 7)

IMPAIRED INFLOW TO MARYSVILLE RESERVOIR
UNDER ASSUMED 1995 CONDITIONS
OF UPSTREAM DEVELOPMENT

(all quantities in 1,000's of acre-feet)

	Release from Narrows Power-plants, and spills 1/ (1)	Washing-ton, Lang Crossing, and Bowman gages + (2)	Accre-tions in Col.(2) intercep-ted by Bowman Spaulding Conduit 2/ -(3)	Spills at Spaulding Dam 3/ + (4)	Diver-sions to Excelsior Ditch 4/ + (5)	Spills at Bitney Corner Reservoir 5/ + (6)	Natural accre-tions between Bitney Corner Reservoir and Deer Creek gage + (7)	Impaired flow of French Dry Creek at mouth 6/ + (8)	Yuba River accre-tions below Engle-bright Dam and Deer Cr. gage + (9)	Impaired inflow to Marys-ville Reservoir = (10)
Jan	43.6	2.8	1.0		0		.5	.8	.4	47.1
Feb	41.3	3.4	1.0		0		.6	.9	.4	45.6
Mar	75.5	11.0	3.1		0		1.5	3.4	1.9	90.2
Apr	50.0	11.6	5.7		7.5		.5	1.6	.4	65.9
May	80.8	4.3	3.4		4.5		.3	1.1	.1	87.7
Jun	94.9	1.3	1.1		2.6		.2	1.4	0	99.3
Jul	111.7	.7	.3		2.0		.1	1.5	0	115.7
Aug	91.6	.8	0		1.9		0	1.4	0	95.7
Sep	69.1	.7	.4		1.9		0	1.1	0	72.4
Oct	62.1	1.0	.9		2.4		.1	.8	.1	65.6
Nov	29.8	.8	.2		0		.1	.2	.1	30.8
Dec	25.0	1.3	1.0		0		.1	2.7	.1	28.2
Total	775.4	39.7	18.1	0	22.8	0	4.0	16.9	3.5	844.2
Jan	124.8	18.2	5.4		0		3.3	6.4	3.7	151.0
Feb	264.3	30.2	5.0		0	0.3	4.7	15.7	5.7	315.9
Mar	562.0	37.0	10.3		0	16.2	4.7	40.2	6.0	655.8
Apr	282.3	21.6	7.9	7.0	7.5	6.1	1.7	3.2	.8	322.3
May	94.2	9.0	8.1	48.0	5.5		0.4	1.4	.1	150.5
Jun	112.1	1.9	1.7	78.9	2.0		0.1	1.5	0	194.8
Jul	117.8	.9	.3		2.2		0.1	1.6	0	122.3
Aug	106.1	1.1	0		2.3		0	1.6	0	111.1
Sep	78.0	.9	.8		2.1		0.1	1.3	0	81.6
Oct	51.4	.8	0		3.1		0.2	.9	0	56.4
Nov	33.6	2.4	1.2		0		0.4	.6	.2	36.0
Dec	80.3	15.1	3.8		0		2.7	5.4	2.7	102.4
Total	1906.9	139.1	44.5	133.9	24.7	22.6	18.4	79.8	19.2	2300.1

1939 1940

1/ From IECO's "Definitive Reservoir Operation and Power Study," March 1963.
2/ From DWR operation study of Nevada Irrigation District works.
3/ From DWR operation study of Nevada Irrigation District and Pacific Gas and Electric Company works.
4/ From IECO's report on "Development of Water Resources of Yuba River," January 1961.
5/ From DWR operation study of Deer Creek works including enlarged Scotts Flat and Bitney Corner Reservoirs.
6/ From DWR operation study of French Dry Creek with New York Flat and Virginia Ranch Reservoirs.

TABLE I-2

RUNOFF OF SOUTH YUBA RIVER AT LANG CROSSING
Estimated and Computed Natural Flows

Unit 1,000 AF Area 119.8 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
21	4.2	31.7	21.0	27.4	15.8	43.3	62.9	117.9	72.5	12.5	5.1	3.3	417.6
22	1.5	2.1	4.4	3.6	11.9	14.2	44.7	185.4	143.5	16.2	4.7	2.3	434.5
23	2.6	5.0	19.6	13.8	9.6	21.5	70.9	109.9	46.0	15.8	6.0	4.3	325.0
24	6.3	5.1	4.6	5.8	15.6	10.9	37.5	38.2	5.9	2.0	2.0	1.8	135.7
1924-25	1.6	7.5	8.3	9.1	42.8	28.8	65.4	100.1	47.7	11.9	4.3	2.8	330.3
26	4.5	6.4	9.7	9.5	15.8	39.2	87.4	55.8	9.3	1.7	2.0	1.7	243.0
27	1.2	19.4	14.9	20.5	40.1	47.6	98.0	147.7	105.2	21.1	6.1	3.6	525.4
28	3.5	21.6	9.8	13.1	13.7	88.3	94.8	98.8	18.7	6.5	4.9	4.0	377.7
29	1.0	2.6	2.3	3.3	4.4	12.4	38.3	85.0	33.1	5.3	4.3	2.6	194.6
1929-30	.8	.8	13.6	11.9	19.4	33.7	79.6	80.6	34.3	4.6	2.9	2.2	289.4
31	1.3	3.4	2.2	4.6	6.3	21.3	47.4	35.3	12.5	1.6	1.5	1.5	138.9
32	1.8	2.0	4.6	5.0	8.5	28.2	60.2	120.6	78.5	15.9	4.4	2.3	332.0
33	.9	.9	1.3	1.8	1.7	3.6	37.6	71.1	69.3	7.4	3.0	2.4	201.0
34	6.3	5.5	10.6	15.8	18.7	48.0	43.4	25.5	12.6	1.8	1.6	1.7	191.5
1934-35	1.1	6.8	6.0	5.7	9.0	11.2	110.2	145.0	73.8	11.2	3.5	1.8	385.3
36	1.7	2.8	2.8	23.8	26.6	39.9	103.1	137.6	76.9	14.9	4.7	2.8	437.6
37	1.0	1.0	1.9	.9	8.5	17.0	63.3	157.5	45.2	8.7	3.7	2.4	311.1
38	1.4	4.8	50.7	11.0	12.6	29.2	79.0	200.1	106.8	22.1	8.2	3.4	529.3
39	2.2	5.1	5.7	5.0	4.1	19.9	59.9	34.6	8.2	1.9	1.6	1.9	150.1
1939-40	5.1	1.5	3.7	41.8	37.8	77.4	81.4	110.1	31.8	4.7	2.5	2.1	399.9
41	1.3	4.8	15.6	15.6	29.6	39.3	57.6	160.1	54.2	15.0	5.7	3.7	402.5

TABLE I-3

RUNOFF OF CANYON CREEK BELOW BOWMAN LAKE
Estimated and Computed Natural Flows

Unit 1,000 AF Area 28.6 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	2.2	10.1	6.0	9.5	4.5	13.1	13.6	24.2	15.4	4.1	1.8	1.5	106.0
22	.9	.8	1.4	1.4	3.8	4.8	10.9	42.9	34.4	6.0	1.8	1.2	110.3
23	1.4	1.9	6.4	4.0	2.3	4.1	15.5	26.1	12.4	4.7	1.6	1.5	81.9
24	2.5	1.3	1.2	1.5	4.3	2.4	7.5	6.4	1.7	1.3	1.2	1.3	32.6
1924-25	.8	2.7	4.1	3.4	14.6	8.6	13.1	20.4	9.9	4.0	.8	.8	83.2
26	2.2	2.3	4.7	3.5	5.2	11.4	17.0	11.0	1.9	.5	.4	.5	60.6
27	.6	7.2	7.5	7.9	14.0	14.5	20.0	30.6	22.2	7.2	1.2	1.1	134.0
28	1.4	6.2	2.5	2.2	7.4	25.3	12.8	18.6	4.0	2.0	1.4	1.2	85.0
29	.6	1.0	1.2	1.2	2.5	7.4	8.9	18.7	6.8	1.9	.9	.8	51.9
1929-30	.4	.3	8.5	4.4	5.9	5.6	15.2	13.9	4.0	1.4	.5	.6	60.7
31	.7	1.3	1.1	1.7	1.2	5.8	8.0	8.8	2.5	.6	.3	.4	32.4
32	1.0	.8	2.5	4.5	6.9	8.6	12.4	26.7	18.9	5.8	1.0	.7	89.8
33	.5	.4	.7	.8	1.6	4.5	8.0	13.4	16.2	2.9	.7	.8	50.5
34	2.9	1.8	4.6	4.0	5.3	12.6	12.4	4.6	1.3	.5	.3	.4	50.7
1934-35	.6	2.5	3.0	3.0	3.3	4.9	17.9	30.7	15.2	3.8	.7	.5	86.1
36	.9	1.0	1.3	10.0	9.3	11.8	21.2	27.2	14.4	4.8	.9	.8	103.6
37	.5	.4	1.0	2.1	3.6	6.6	11.8	31.7	10.5	3.0	.8	.7	72.7
38	.7	1.8	27.0	4.1	5.7	5.9	14.5	40.7	30.1	7.8	1.7	1.0	141.0
39	1.3	2.1	3.1	3.1	1.7	7.1	14.0	8.2	2.3	.7	.3	.6	44.5
1939-40	2.7	.6	1.9	14.0	12.1	26.4	17.2	25.3	5.9	1.6	.5	.6	108.8
41	.8	2.0	8.7	8.2	8.6	12.0	14.2	35.8	14.1	5.7	1.3	1.2	112.6

TABLE I-4

RUNOFF OF SOUTH YUBA RIVER NEAR WASHINGTON
Estimated Natural Flows

Unit 1,000 AF Area 197.4 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	7.9	53.8	39.1	53.0	31.3	75.9	90.9	154.0	93.4	18.0	8.1	5.8	631.2
22	3.4	4.3	10.2	9.2	29.9	32.2	76.6	263.0	197.2	25.3	8.4	4.7	664.4
23	5.3	9.9	41.6	26.1	18.0	33.0	108.0	152.8	64.5	22.6	9.1	7.2	498.1
24	10.4	7.9	7.7	9.4	27.4	15.9	51.7	47.4	8.2	3.7	4.0	3.9	197.6
1924-25	3.6	13.4	17.8	18.1	86.8	47.4	97.9	132.2	60.9	16.9	6.4	4.8	506.2
26	8.0	10.6	16.9	17.1	37.0	59.6	125.5	72.8	12.4	2.8	3.2	3.0	368.9
27	3.1	43.5	28.7	38.0	106.2	82.5	147.1	197.2	135.0	30.3	8.7	5.7	826.0
28	6.0	34.8	16.7	21.5	29.0	169.6	127.0	126.8	24.6	9.4	7.4	6.0	578.8
29	2.5	5.7	7.6	6.8	13.5	27.0	57.2	113.9	44.2	8.4	6.3	4.2	297.3
1929-30	2.2	1.8	40.7	25.8	35.0	54.1	108.1	103.3	40.9	6.9	4.4	3.6	426.8
31	2.9	7.0	4.6	10.2	11.6	34.6	60.8	47.5	16.3	2.7	2.5	2.5	203.2
32	3.8	4.7	14.2	15.8	26.0	51.7	89.5	168.0	104.8	23.3	6.7	3.8	512.3
33	2.3	2.5	3.4	4.4	6.0	16.3	57.2	96.6	92.2	11.6	4.7	3.9	301.1
34	10.4	8.7	20.5	26.5	31.4	70.1	62.2	33.3	15.1	2.9	2.6	2.7	286.4
1934-35	2.4	12.6	12.1	17.3	20.3	25.8	164.7	194.1	95.3	16.2	5.3	3.2	569.3
36	3.6	5.2	5.8	52.4	65.7	66.4	146.3	177.2	95.7	21.0	6.8	4.5	650.6
37	2.3	2.5	4.2	4.4	22.5	36.7	97.7	208.9	60.0	13.0	5.7	4.0	461.9
38	3.1	10.7	99.5	21.0	35.5	70.5	124.7	271.6	147.4	32.2	11.8	5.6	833.6
39	5.1	9.5	11.3	10.9	9.2	38.0	85.5	47.1	11.8	3.3	2.7	3.2	237.6
1939-40	8.8	2.9	6.9	74.0	80.1	140.8	120.2	144.4	39.6	7.2	4.1	3.6	632.6
41	2.9	9.2	39.4	41.5	65.2	69.9	90.4	215.2	73.0	22.6	8.8	6.1	644.2
42	3.1	12.0	59.4	74.7	58.3	33.9	122.8	159.3	135.3	38.6	9.4	5.5	712.3

TABLE I-5

RUNOFF OF DEER CREEK NEAR SMARTVILLE
Estimated and Computed Natural Flows

Unit 1,000 AF Area 84.3 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	2.4	27.3	31.3	41.0	31.9	38.4	12.1	7.7	3.4	1.6	.4	.5	198.0
22	1.6	2.7	10.6	11.9	37.2	32.5	26.0	28.3	9.3	2.8	.8	.4	164.1
23	1.8	5.2	28.3	14.0	8.9	8.5	12.7	3.7	2.0	1.3	.5	1.0	87.9
24	2.6	3.1	3.4	3.6	10.0	1.6	2.9	.8	.3	.4	.3	.3	29.3
1924-25	1.5	4.0	7.1	9.9	41.0	8.8	9.9	3.5	2.1	.9	.4	.5	89.6
26	1.3	2.4	2.4	4.8	25.5	7.5	10.6	2.3	.8	.4	.2	.3	58.5
27	1.0	16.8	5.1	15.7	60.5	20.3	16.1	5.6	2.3	.9	.4	.4	145.1
28	.9	7.7	4.6	9.1	10.4	51.4	11.5	2.4	1.0	.7	.4	.4	100.5
29	.9	1.9	3.4	2.4	6.5	8.2	8.4	3.4	2.2	.9	.3	.3	38.8
1929-30	.3	.5	15.5	11.3	15.7	23.5	7.6	3.3	1.3	.5	.3	.4	80.7
31	.9	4.2	.7	5.6	5.2	8.3	1.5	.7	.6	.3	.2	.2	28.4
32	1.3	3.1	17.1	16.0	18.3	19.6	10.8	9.0	3.7	1.4	.5	.5	101.3
33	.6	.9	1.0	1.5	2.6	15.3	8.6	8.4	3.3	1.1	.4	.4	44.1
34	1.0	.9	4.0	7.2	11.3	6.7	1.9	1.3	.8	.4	.2	.2	35.9
1934-35	.9	4.6	3.8	11.6	14.8	15.2	36.4	10.3	2.1	1.0	.4	.4	101.5
36	1.4	1.0	1.3	34.8	53.5	9.2	8.1	4.2	2.9	1.2	.4	.4	118.4
37	.6	.7	.9	1.3	16.4	22.1	22.3	12.5	2.6	1.4	.5	.5	81.8
38	.9	5.0	17.9	12.5	30.1	60.6	23.1	16.5	4.7	1.9	.8	.7	174.7
39	1.8	1.6	2.0	4.6	5.4	12.4	4.4	2.7	1.7	.4	.3	.4	37.7
1939-40	.8	.5	.6	27.6	39.2	39.1	13.7	3.4	1.1	.7	.3	.4	127.4
41	1.2	3.6	22.4	34.6	34.4	22.9	20.3	10.0	2.7	2.1	1.0	.9	156.1

TABLE I-6

RUNOFF OF YUBA RIVER AT ENGLEBRIGHT DAM
Estimated Natural Flows

Unit 1,000 AF Area 1,107.3 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	41.7	268.1	270.2	380.3	268.8	453.1	358.1	445.1	273.5	67.5	33.9	26.0	2,886.3
-22	27.0	29.0	84.6	102.7	226.4	246.5	376.4	907.8	668.6	120.0	44.8	27.0	2,860.8
-23	37.8	66.7	244.4	169.7	123.5	169.3	378.4	454.8	206.6	82.5	40.8	36.7	2,005.2
-24	48.2	37.2	43.1	52.4	134.4	60.4	140.7	95.5	25.3	16.3	15.2	15.6	684.3
1924-25	31.6	59.5	92.9	113.2	520.1	223.0	381.6	373.3	148.4	48.9	28.6	25.3	2,046.4
-26	35.7	47.3	69.1	83.0	287.2	225.2	440.0	203.6	52.7	22.4	17.8	17.2	1,503.2
-27	29.5	229.8	142.1	262.6	720.8	414.1	524.1	569.2	380.7	92.7	36.4	27.2	3,365.2
-28	29.6	125.0	80.4	115.9	140.9	914.9	419.8	363.6	72.9	33.7	24.0	20.9	2,341.6
-29	23.6	34.7	58.9	46.0	85.1	131.6	183.3	290.6	128.7	36.0	23.8	18.6	1,066.9
1929-30	19.5	17.0	263.9	144.8	201.2	289.[illegible]	351.5	277.6	118.5	34.0	22.4	20.2	1,759.6
-31	21.4	39.5	28.0	63.3	67.1	146.8	153.2	110.3	42.9	15.9	12.1	12.3	713.1
-32	24.5	31.7	117.0	129.3	167.8	290.9	338.3	544.0	317.8	73.3	30.2	21.1	2,076.9
-33	22.1	24.2	38.0	36.2	44.7	130.9	217.1	288.3	264.2	44.8	22.3	18.8	1,143.6
-34	31.1	30.6	84.0	116.7	143.5	250.8	187.4	91.7	40.3	16.8	13.9	13.3	1,019.2
1934-35	18.7	58.8	65.9	129.1	149.6	173.0	446.5	580.7	292.6	59.4	27.5	20.9	2,222.7
-36	25.6	29.2	37.7	329.1	456.5	531.9	503.2	483.4	241.6	62.0	29.3	23.2	2,548.7
-37	22.3	24.2	31.2	34.9	162.3	236.6	356.1	662.2	194.7	52.1	27.3	21.4	1,805.6
-38	21.1	79.4	454.6	126.0	339.2	619.4	549.2	807.7	465.3	118.6	42.1	26.1	3,688.7
-39	35.7	42.0	50.2	54.0	53.9	196.9	269.7	120.4	49.4	21.5	16.7	16.2	912.6
1939-40	27.7	18.9	62.8	356.9	521.7	721.6	469.3	397.9	118.0	34.8	22.3	20.9	2,736.8
-41	23.8	57.2	258.3	322.5	480.4	399.3	380.6	653.2	237.7	79.6	38.1	29.3	2,968.6

RUNOFF OF YUBA RIVER AT MARYSVILLE DAMSITE
Estimated Natural Flows

Unit 1,000 AF Area 1,327.1 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	45.0	316.0	341.4	484.7	340.0	543.6	379.9	457.0	278.4	69.7	34.5	26.8	3,317.0
22	29.2	34.1	110.5	164.1	306.0	329.6	426.1	953.4	680.4	123.8	46.1	27.8	3,231.1
23	40.2	69.6	306.7	204.0	142.8	188.6	400.7	460.3	209.4	84.2	41.6	38.2	2,186.3
24	51.4	41.8	49.2	59.4	152.0	63.4	145.1	96.6	25.7	16.8	15.6	16.0	733.0
1924-25	33.6	66.3	108.5	137.4	608.5	243.0	398.9	378.6	151.4	50.1	29.3	26.1	2,231.7
26	37.4	51.2	74.2	94.2	339.9	241.5	457.9	206.9	53.8	22.9	18.1	17.6	1,615.6
27	26.8	259.5	153.7	243.0	856.8	462.4	553.2	577.8	383.9	94.0	36.9	27.7	3,675.7
28	30.8	137.9	90.3	137.7	162.9	1,029.6	439.6	367.1	74.3	34.5	24.5	21.4	2,550.6
29	24.8	37.7	65.7	51.3	97.9	148.6	197.0	295.5	131.7	37.1	24.2	19.0	1,130.5
1929-30	19.9	17.8	296.4	171.0	233.6	339.9	366.3	283.2	120.3	34.6	22.8	20.7	1,926.5
31	22.4	45.5	29.2	73.6	75.9	161.2	155.7	111.1	43.6	16.2	12.3	12.5	759.2
32	26.2	37.1	155.1	160.1	207.9	336.1	357.4	557.6	323.0	75.1	31.0	21.8	2,288.4
33	22.8	25.7	32.2	39.7	50.1	164.9	231.9	300.8	268.7	46.2	22.8	19.3	1,225.0
34	32.4	31.9	91.3	130.9	162.6	263.4	190.2	93.4	41.2	17.3	13.2	13.6	1,081.4
1934-35	19.9	67.2	75.0	160.2	184.2	210.6	714.5	597.0	295.7	60.7	28.1	21.4	2,434.5
36	27.3	30.9	40.9	405.8	565.3	361.1	519.4	489.3	245.5	63.5	29.9	23.7	2,802.6
37	23.2	25.5	33.5	38.4	200.1	290.6	437.1	621.8	198.4	54.0	28.1	22.2	1,972.9
38	22.3	88.2	496.2	158.5	403.8	765.2	591.4	853.3	492.0	121.1	43.4	27.1	4,062.5
39	38.0	44.8	54.6	62.2	62.9	226.0	257.9	129.7	51.4	22.0	17.1	16.7	983.3
1939-40	29.0	20.1	34.6	411.0	610.8	813.3	490.4	402.3	119.5	35.6	22.7	21.4	3,010.7
41	25.3	62.5	312.6	403.5	561.2	451.2	409.8	667.8	241.4	82.3	40.3	30.5	3,288.4

TABLE I-8

RUNOFF OF FRENCH DRY CREEK AT MOUTH
Estimated Natural Flows

Unit 1,000 A.F. Area 107.9 Sq. Miles

SEASON	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
1920-21	0.8	19.3	35.4	55.4	39.2	48.3	8.9	4.0	1.3	0.5	0.3	0.3	213.7
22	0.5	1.9	12.1	16.3	46.0	41.2	35.0	14.9	3.9	0.9	0.4	0.3	173.4
23	0.5	3.3	29.2	17.1	9.9	9.6	8.7	1.7	0.8	0.4	0.3	0.5	82.0
24	0.7	0.9	1.5	1.9	4.9	0.8	0.8	0.1	0.1	0.1	0.1	0.1	12.0
1924-25	0.5	2.4	7.1	11.3	43.6	9.5	6.5	1.4	0.8	0.3	0.3	0.3	84.0
26	0.4	1.2	2.0	4.7	23.8	7.0	6.0	0.9	0.3	0.1	0.1	0.1	46.6
27	0.4	11.5	5.6	20.5	71.9	24.5	11.9	2.8	0.9	0.3	0.3	0.1	150.7
28	0.3	4.8	4.5	10.5	11.3	55.4	7.6	1.1	0.4	0.3	0.1	0.1	96.4
29	0.3	0.9	2.4	2.1	4.8	6.4	4.0	1.1	0.7	0.3	0.1	0.1	23.2
1929-30	0.1	0.3	14.3	12.3	15.6	23.8	4.7	1.6	0.5	0.1	0.1	0.1	73.5
31	0.3	1.1	0.3	2.7	2.3	3.6	0.4	0.1	0.1	0.1	0	0.1	11.1
32	0.4	2.0	18.0	19.8	20.7	22.7	7.6	4.4	1.4	0.4	0.3	0.3	98.0
33	0.1	0.4	0.9	1.5	2.3	14.3	4.8	3.2	1.1	0.3	0.1	0.1	29.1
34	0.3	0.3	2.3	4.7	6.7	4.1	0.6	0.4	0.3	0.1	0.1	0.1	20.0
1934-35	0.3	3.2	4.5	16.1	18.7	19.6	28.4	5.5	0.9	0.3	0.3	0.1	97.9
36	0.3	0.7	1.7	38.3	53.3	17.6	7.4	1.6	0.9	0.3	0.3	0.3	122.7
37	0.1	3.5	7.7	11.9	14.1	19.5	11.9	4.5	0.9	0.4	0.3	0.3	75.1
38	0.3	3.6	20.7	17.1	37.3	77.1	17.9	8.7	2.0	0.6	0.4	0.3	186.0
39	0.5	0.9	1.9	2.4	2.9	12.6	3.0	0.5	0.3	0.1	0.1	0.1	25.3
1939-40	0.5	0.5	10.3	25.2	44.8	43.6	6.3	1.0	0.4	0.1	0.3	0.3	133.3
41	0.3	1.5	20.7	39.6	45.3	26.1	8.3	4.4	1.1	0.7	0.5	0.4	148.9

TABLE I-9

FIXED RELEASES FROM MARYSVILLE RESERVOIR [1/]
(in 1,000 acre-feet)

Month	Cordua-Hallwood	Other present downstream rights	Browns Valley Irrigation District	Allowance for downstream percolation losses	Total
January	0	0	0	5.0	5.0
February	0	0	0	5.0	5.0
March	1.3	0	0	5.0	6.3
April	9.4	0.2	1.2	5.0	15.8
May	21.5	0.6	2.4	5.0	29.5
June	24.2	0.6	2.4	5.0	32.2
July	25.5	0.7	2.5	5.0	33.7
August	24.2	0.6	2.4	5.0	32.2
September	17.5	0.5	2.4	5.0	25.4
October	10.7	0.3	1.2	5.0	17.2
November	0	0	0	5.0	5.0
December	0	0	0	5.0	5.0
TOTAL	134.3	3.5	14.5	60.0	212.3

1/ Not subject to reduction in dry years

TABLE I-10

RELEASES FROM MARYSVILLE RESERVOIR TO NORTH AND SOUTH CANALS OF YUBA COUNTY WATER AGENCY
1921-1940
(in 1,000 acre-feet)

Month	All years except as shown	Years of short supply in the amounts shown, from IECO'S "Definitive Reservoir Operation & Power Study", March 1963						
		1924	1929	1930	1931	1933	1934	1939
January	0							
February	0							
March	3.7							
April	13.3				1.8			
May	54.9	11.0	3.9	9.7	11.0	3.4	1.7	11.0
June	69.5	24.9	6.9	6.9	13.9	0	11.0	13.9
July	84.1	2.3	1.9	6.9	1.7	5.6	13.9	6.6
August	73.2	9.9	7.4	7.4	9.9	7.4	8.6	14.6
September	51.2	3.7	5.1	5.1	3.8	5.1	13.4	8.8
October	11.1			1.1		0.3	7.5	
November	0							
December	0							
TOTAL	366.0	51.8	26.4	32.9	42.1	29.8	52.1	54.3

TABLE I-11

ANNUAL BASIN RUNOFF AND DRY YEAR
REDUCTIONS IN FISH RELEASES

Water year	Basin runoff above Smartville in percent of normal	Percent reduction in fish release 1/
1920-21	132	-
-22	129	-
-23	90	-
-24	31	30
-25	91	-
1925-26	67	-
-27	150	-
-28	105	-
-29	47	15
-30	79	-
1930-31	31	30
-32	93	-
-33	51	-
-34	46	15
-35	99	-
1935-36	114	-
-37	81	-
-38	165	-
-39	41	20
-40	123	-
1940-41	134	-

1/ In no event shall releases be reduced to less than 70 second-feet.

TABLE I-12 (1 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1 (1)	Gross storage on first of month (2)	Flood control reservation requirement (3)	Evaporation (4)	Mandatory release for local uses and fish 1/ (5)	Flow appropriated by downstream users 2/ (6)	Additional fishery maintenance release 3/ (7)	1995 surplus flows in the Delta 4/ (8)	Export release to Delta (9)	Flood control releases or spill (10)
Jan										
Feb										
Mar										
Apr										
May										
Jun										
Jul 1921	162.2	1,000.0		8.9	122.1	40.1	11.1		50.0	
Aug	110.0	930.0		7.5	109.7	0.3	0		50.0	
Sep	81.8	872.5		5.1	80.8	1.0	0		35.0	
Oct	56.3	832.4	90	3.0	52.9	3.4	0			
Nov	32.9	829.4	160	-1.0	28.8	4.1	0			
Dec	57.2	830.4	160	-3.0	29.6		0			53.4
Total	(500.4)			(20.5)	(423.9)	(48.9)	(11.1)		(135.0)	(53.4)
Jan	71.9	780.0	220	-1.5	20.1		9.5	1,311		63.8
Feb	184.0	760.0	240	0	18.6		8.6	3,771		176.8
Mar	295.1	740.0	260	0	25.1		.3	2,039		269.7
Apr	265.6	740.0	260	1.8	48.7		.3	1,284		54.8
May	691.9	900.0	100	4.2	99.5		.3	2,979		487.9
Jun 1922	545.6	1,000.0		7.2	116.3		.3	1,031		421.8
Jul	207.1	1,000.0		8.9	122.1	85.0	11.1		50.0	
Aug	121.0	930.0		7.5	109.7	11.3	0		50.0	
Sep	82.1	872.5		5.1	80.8	1.3	0		35.0	
Oct	57.4	832.4	90	3.0	52.9	4.5	0			
Nov	39.3	829.4	160	-1.0	28.8		0	85		0.9
Dec	130.2	840.0	160	-3.0	29.6		0	1,606		203.6
Total	2,691.2			32.2	752.2	102.1	30.4		135.0	1,679.3
Jan	157.9	740.0	260	-1.4	20.1		9.5	1,848		129.7
Feb	122.3	740.0	260	0	18.6		8.6	984		
Mar	156.7	835.1	160	0	25.1		.3	534		126.4
Apr	200.1	840.0	160	2.0	48.7		.3	1,191		
May	257.4	989.1	90	4.4	99.5		.3	410		142.3
Jun 1923	134.9	1,000.0		7.2	116.3	18.6	.3		20.0	
Jul	170.3	972.5		8.7	122.1	48.2	11.1		50.0	
Aug	115.9	902.7		7.3	109.7	6.2	0		50.0	
Sep	84.0	845.4		5.0	80.8	3.2	0		35.0	
Oct	67.7	805.4	90	3.0	52.9	14.8	0			
Nov	36.3	802.4	160	-1.0	28.8	7.5	0			
Dec	40.4	803.4	160	-3.0	29.6		0	1,410		
Total	1,543.9			32.2	752.2	98.5	30.4		155.0	398.4

TABLE I-12 (2 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1 (1)	Gross storage on first of month (2)	Flood control reservation requirement (3)	Evaporation (4)	Mandatory release for local uses and fish 1/ (5)	Flow appropriated by downstream users 2/ (6)	Additional fishery maintenance release 3/ (7)	1995 surplus flows in the Delta 4/ (8)	Export release to Delta (9)	Flood control releases or spill (10)
Jan	50.8	817.2	160	-1.5	20.1		9.5	90		
Feb	75.1	839.9	160	0	18.6		8.6	540		47.8
Mar	40.2	840.0	160	0	25.1	15.1	.3			
Apr	59.0	839.7	160	2.0	48.7	10.3	.3			
May	84.5	837.4	90	4.0	84.0	0.5	.2		40.0	
Jun	97.0	793.2		6.3	87.0	10.0	.2		50.0	
Jul	118.3	736.7		7.4	118.3	0	7.8		50.0	
Aug	98.8	671.5		6.2	98.8	0	0		50.0	
Sep	76.7	615.3		4.2	76.7	0	0		40.0	
Oct	73.7	571.1	90	2.4	45.5	28.2	0			
Nov	43.4	568.7	160	-0.8	21.7	21.7	0			
Dec	37.7	569.5	170	-2.4	22.0	15.5	0			
1924 Total	855.2			27.8	666.7	101.3	26.9		230.0	47.8
Jan	74.2	571.9	180	-1.3	15.6	58.6	6.6			
Feb	244.6	566.6	190	0	14.5		6.0	4,579		30.7
Mar	80.1	760.0	240	0	20.6		.2	722		59.3
Apr	114.8	760.0	240	1.9	44.3		.2	693		
May	161.9	828.4	90	4.0	99.5		.3	366		
Jun	119.6	886.5		6.7	116.3	3.3	.3		20.0	
Jul	121.5	859.5		8.1	121.5	0	11.0		50.0	
Aug	110.9	790.4		6.8	109.7	1.2	0		50.0	
Sep	82.8	733.6		4.6	80.8	2.0	0		35.0	
Oct	57.6	694.0	90	2.7	52.9	4.7	0			
Nov	36.2	691.3	160	-0.9	28.8	7.4	0			
Dec	40.2	692.2	160	-2.7	29.6	10.6	0			
1925 Total	1,244.4			29.9	734.1	87.8	24.6		155.0	90.0
Jan	58.8	694.9	160	-1.4	20.1	38.7	9.5			
Feb	164.6	686.8	160	0	18.6		8.6	3,398		64.2
Mar	157.5	760.0	240	0	25.1		.3	370		72.1
Apr	232.5	820.0	180	1.9	48.7		.3	539		91.6
May	123.4	910.0	90	4.2	99.5	23.9	.3		40.0	
Jun	117.0	865.5		6.6	116.3	0.7	.3		50.0	
Jul	121.2	808.6		7.8	121.2	0	11.1		50.0	
Aug	109.7	739.7		6.5	109.7	0	0		50.0	
Sep	81.6	683.2		4.5	80.8	0.8	0		40.0	
Oct	57.2	638.7	90	2.6	52.9	4.3	0			
Nov	107.4	636.1	160	-0.8	28.8		0	508		
Dec	59.8	715.5	260	-2.7	29.6		0	282		
1926 Total	1,390.7			29.2	751.3	68.4	30.4		230.0	227.9

TABLE I-12 (3 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1	Gross storage on first of month	Flood control reservation requirement	Evaporation	Mandatory release for local uses and fish 1/	Flow appropriated by downstream users 2/	Additional fishery maintenance release 3/	1995 surplus flows in the Delta 4/	Export release to Delta	Flood control releases or spill
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Jan	96.3	748.4	250	-1.5	20.1	76.2	9.5	957		
Feb	687.9	816.6	160	0	18.6		8.6	7,876		737.3
Mar	377.1	740.0	260	0	25.1		.3	2,588		351.7
Apr	343.1	740.0	260	1.8	48.7		.3	2,208		122.3
May	391.6	910.0	90	4.2	99.5		.3	886		197.6
Jun	282.9	1,000.0		7.2	116.3	166.6	.3		20.0	
Jul	172.0	972.5		8.7	122.1	49.9	11.1		50.0	
Aug	111.3	902.7		7.3	109.7	1.6	0		50.0	
Sep	82.3	845.4		5.0	80.8	1.5	0		35.0	
Oct	55.7	805.4	90	2.9	52.9	2.8	0			
Nov	50.1	802.5	160	-1.0	28.8		0	281		4.8
Dec	42.1	820.0	180	-2.9	29.6		0	498		35.4
1927 Total	2,692.4			31.7	752.2	298.6	30.4		155.0	1,449.1
Jan	67.7	800.0	200	-1.5	20.1		9.5	1,166		
Feb	103.5	839.6	160	0	18.6		8.6	1,972		75.9
Mar	875.3	840.0	160	0	25.1		.3	5,682		949.9
Apr	272.2	740.0	260	1.8	48.7		.3	1,448		101.4
May	207.4	860.0	140	4.2	99.5	107.9	.3			
Jun	117.8	855.5		6.9	116.3	1.5	.3		20.0	
Jul	122.0	828.3		7.9	122.0	0	11.1		50.0	
Aug	109.9	579.3		6.6	109.7	0.2	0		50.0	
Sep	81.6	702.7		4.5	80.8	0.8	0			
Oct	56.1	698.2	90	2.7	52.9	3.2	0			
Nov	35.6	695.5	160	-0.9	28.8	6.8	0			
Dec	47.8	696.4	160	-2.7	29.6	18.2	0			
1928 Total	2,096.9			29.5	752.1	138.6	30.4		120.0	1,127.2
Jan	48.5	699.1	160	-1.4	20.1	28.4	9.5			
Feb	64.5	691.0	160	0	18.6		8.6	318		
Mar	74.3	728.3	160	0	25.1		.3	232		
Apr	77.3	777.2	160	1.9	48.7	28.6	.3			
May	98.4	775.0	90	3.8	91.7	6.7	.3		40.0	
Jun	112.1	730.9		6.0	107.2	4.9	.3		50.0	
Jul	121.1	674.6		7.1	120.6	0.5	9.4		50.0	
Aug	102.7	608.1		5.9	102.3	0.4	0		50.0	
Sep	76.4	552.2		3.9	75.7	0.7	0			
Oct	56.1	548.3	90	2.4	49.2	6.9	0			
Nov	30.0	545.9	160	-0.8	25.2	4.8	0			
Dec	94.9	546.7	160	-2.3	25.9	69.0	0			
1929 Total	956.3			26.5	710.3	150.9	28.7		190.0	0

TABLE I-12 (4 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1	Gross storage on first of month	Flood control reservation requirement	Evaporation	Mandatory release for local uses and fish 1/	Flow appropriated by downstream users 2/	Additional fishery maintenance release 3/	1995 surplus flows in the Delta 4/	Export release to Delta	Flood control releases or spill
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Jan	88.8	549.0	230	-1.2	17.8		8.1	856		
Feb	89.7	613.1	260	0	16.6		7.3	124		
Mar	155.3	678.9	210	0	22.8		.3	1,049		
Apr	161.1	811.1	170	1.9	46.5	114.6	.3			
May	117.3	808.9	90	3.9	94.0	23.3	.3			
Jun	111.2	804.7		6.4	109.4	1.8	.3		20.0	
Jul	115.5	778.0		7.7	115.2	0.3	11.1		50.0	
Aug	103.3	709.2		6.4	102.3	1.0	0		50.0	
Sep	76.2	652.8		4.3	75.7	0.5	0		35.0	
Oct	55.7	613.5	90	2.5	51.8	3.9	0			
Nov	36.9	611.0	160	-0.8	28.8	8.1	0			
Dec	32.0	611.8	160	-2.5	29.6	2.4	0			
1930										
Total	1,143.0			28.6	710.5	155.9	27.7		155.0	0
Jan	58.0	614.3	160	-1.3	20.1		9.5	263		
Feb	53.4	644.0	160	0	18.6	34.8	8.6			
Mar	78.4	635.4	170	0	25.1	53.3	.3			
Apr	53.0	635.1	160	1.7	46.9	6.1	.3			
May	85.5	633.1	90	3.4	84.0	1.5	.2		40.0	
Jun	98.0	589.5		5.3	98.0	0	.2		50.0	
Jul	118.7	534.0		6.2	118.7	0	7.8		50.0	
Aug	98.8	470.0		5.1	98.8	0	0		50.0	
Sep	76.7	414.9		3.4	76.7	0	0		10.0	
Oct	73.2	401.5	90	2.0	45.5	27.7				
Nov	44.2	399.5	160	-0.7	21.7	22.5	0			
Dec	55.9	400.2	170	-2.0	22.2		0	457		
1931										
Total	893.8			23.1	676.3	145.9	26.9		200.0	0
Jan	91.5	435.9	260	-1.1	15.6		6.6	804		
Feb	101.7	506.3	260	0	14.5		6.0	812		
Mar	134.3	587.5	190	0	20.6	113.7	.2			
Apr	105.6	587.3	160	1.6	44.3	61.3	.2			
May	157.2	585.2	90	3.3	99.5	57.7	.3			
Jun	171.4	581.9		5.3	116.3	55.1	.3		20.0	
Jul	160.2	556.3		6.3	122.1	38.1	11.1		50.0	
Aug	111.7	488.9		5.2	109.7	2.0	0		50.0	
Sep	81.8	433.7		3.4	80.8	1.0	0		25.0	
Oct	56.6	405.3	90	2.0	52.9	3.7	0			
Nov	30.1	403.3	160	-0.6	28.8	1.3	0			
Dec	31.8	403.9	160	-2.0	29.6	2.2	0			
1932										
Total	1,233.9			23.4	734.7	336.1	24.7		145.0	0

TABLE I-12 (5 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1 (1)	Gross storage on first of month (2)	Flood control reservation requirement (3)	Evaporation (4)	Mandatory release for local uses and fish 1/ (5)	Flow appropriated by downstream users 2/ (6)	Additional fishery maintenance release 3/ (7)	1995 surplus flows in the Delta 4/ (8)	Export release to Delta (9)	Flood control releases or spill (10)
Jan	44.0	405.9	160	-1.0	20.1		9.5	493		
Feb	44.4	421.3	210	0	18.6		8.6	75		
Mar	86.0	438.5	190	0	25.1	60.9	.3			
Apr	81.1	438.2	160	1.4	48.7	32.4	.3			
May	103.4	436.5	90	2.7	96.1	7.3	.3		40.0	
Jun	124.6	393.5		4.1	116.3	8.3	.3		50.0	
Jul	118.7	339.1		4.6	118.5	0.2	11.1		20.0	
Aug	102.7	303.4		4.0	102.3	0.4	0			
Sep	76.1	299.4		2.8	75.7	0.4	0			
Oct	55.3	296.6	90	1.6	52.6	2.7	0			
Nov	30.9	295.0	160	-0.5	28.8	2.1	0			
Dec	49.1	295.5	160	-1.7	29.6	19.5	0			
1933 Total	916.3			18.0	732.4	134.2	30.4		110.0	0
Jan	76.9	297.2	170	-0.8	20.1		9.5	619		
Feb	81.2	345.3	210	0	18.6	62.6	8.6	-		
Mar	82.6	336.7	180	0	25.1	57.5	.3			
Apr	53.3	336.4	160	1.2	47.0	6.3	.3			
May	86.9	334.9	90	2.3	86.2	0.7	.3		40.0	
Jun	99.9	292.3		3.5	99.9	0	.3		50.0	
Jul	116.0	238.5		3.9	116.0	0	9.4		20.0	
Aug	95.5	205.2		3.2	95.5	0	0			
Sep	72.7	202.0		2.2	72.7	0	0			
Oct	66.9	199.8	90	1.3	49.2	17.7	0			
Nov	41.2	198.5	160	-0.5	25.2	16.0	0			
Dec	28.9	199.0	180	-1.3	25.9	3.0	0			
1934 Total	902.0			15.0	681.4	163.8	28.7		110.0	0
Jan	91.4	200.3	200	-0.7	17.8		8.1	1,126		
Feb	90.8	266.5	220	0	16.6	74.2	7.3	0		
Mar	94.8	259.2	220	0	22.8		.3	1,151		
Apr	231.0	330.9	190	1.2	46.5		.3	2,196		
May	340.0	513.9	140	3.0	99.5		.3	531		
Jun	215.8	751.1	10	6.1	116.3	99.5	.3		20.0	
Jul	154.2	724.7		7.4	122.1	32.1	11.1		50.0	
Aug	110.4	656.2		5.7	109.7	0.7	0		50.0	
Sep	82.6	600.5		4.1	80.8	1.8	0			
Oct	55.8	596.4	90	2.5	52.9	2.9	0			
Nov	30.5	593.9	160	-0.8	28.8	1.7	0			
Dec	33.8	594.7	160	-2.5	29.6	4.2	0			
1935 Total	1,531.1			26.0	743.4	217.1	27.7		120.0	0

TABLE I-12 (6 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1 (1)	Gross storage on first of month (2)	Flood control reservation requirement (3)	Evaporation (4)	Mandatory release for local uses and fish 1/ (5)	Flow appropriated by downstream users 2/ (6)	Additional fishery maintenance release 3/ (7)	1995 surplus flows in the Delta 4/ (8)	Export release to Delta (9)	Flood control releases or spill (10)
Jan	167.4	597.2	160	-1.3	20.1		9.5	2,574		
Feb	491.0	736.3	260	0	18.6		8.6	6,373		460.1
Mar	296.1	740.0	260	0	25.1		.3	2,333		270.7
Apr	320.1	740.0	260	1.8	48.7		.3	534		99.3
May	304.8	910.0	90	4.2	99.5		.3	450		110.8
Jun	165.8	1,000.0		7.2	116.3	49.5	.3		20.0	
Jul	151.6	972.5		8.7	122.1	29.5	11.1		50.0	
Aug	111.3	902.7		7.3	109.7	1.6	0		50.0	
Sep	81.7	845.4		5.0	80.8	0.9	0		35.0	
Oct	56.1	805.4	90	2.9	52.9	3.2	0			
Nov	31.4	802.5	160	-1.0	28.8	2.6	0			
Dec	33.4	803.5	160	-2.9	29.6	3.8	0			
1936 Total	2,210.7			31.9	752.2	91.1	30.4		155.0	940.9
Jan	45.1	806.4	160	-1.5	20.1		9.5	109		23.4
Feb	96.8	800.0	200	0	18.6		8.6	2,225		129.6
Mar	130.9	740.0	260	0	25.1		.3	3,046		105.5
Apr	226.7	740.0	260	1.8	48.7		.3	745		25.9
May	397.2	890.0	110	4.1	99.5		.3	581		183.3
Jun	126.8	1,000.0		7.2	116.3	10.5	.3		20.0	
Jul	150.1	972.5		8.7	122.1	28.0	11.1		50.0	
Aug	111.7	902.7		7.3	109.7	2.0	0		50.0	
Sep	82.6	845.4		5.0	80.8	1.8	0		35.0	
Oct	55.4	805.4	90	2.9	52.9	2.5	0			
Nov	43.0	802.5	160	-1.0	28.8		0	704		
Dec	250.4	817.7	180	-2.9	29.6		0	4,279		301.4
1937 Total	1,716.7			31.6	752.2	44.8	30.4		155.0	769.1
Jan	115.0	740.0	260	-1.4	20.1		9.5	1,458		76.8
Feb	357.2	750.0	250	0	18.6		8.6	8,706		340.0
Mar	707.6	740.0	260	0	25.1		.3	9,451		682.2
Apr	429.5	740.0	260	1.8	48.7		.3	4,540		258.7
May	569.4	860.0	140	4.2	99.5		.3	4,229		325.4
Jun	364.2	1,000.0		7.2	116.3		.3	2,753		240.4
Jul	195.2	1,000.0		8.9	122.1		11.1	71		53.1
Aug	114.9	1,000.0		7.8	109.7	5.2	0		50.0	
Sep	82.9	942.2		5.4	80.8	2.1	0		35.0	
Oct	58.3	901.8	90	3.1	52.9		0	56		64.1
Nov	33.7	840.0	160	-1.0	28.8		0	338		5.9
Dec	36.5	840.0	160	-3.0	29.6		0	747		9.9
1938 Total	3,064.4			33.0	752.2	7.3	30.4		85.0	2,056.5

TABLE I-12 (7 of 7)

ILLUSTRATIVE OPERATION STUDY OF MARYSVILLE RESERVOIR
AS A UNIT OF THE STATE WATER PROJECT

(all quantities in 1,000's of acre-feet)

Month and year	1995 impaired inflow from Table I-1	Gross storage on first of month	Flood control reservation requirement	Evaporation	Mandatory release for local uses and fish 1/	Flow appropriated by downstream users 2/	Additional fishery maintenance release 3/	1995 surplus flows in the Delta 4/	Export release to Delta	Flood control releases or spill
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Jan	47.1	840.0	160	-1.5	20.1		9.5	668		19.0
Feb	45.6	840.0	160	0	18.6		8.6	876		28.4
Mar	90.2	830.0	170	0	25.1		.3	884		74.8
Apr	65.9	820.0	180	1.9	48.7	17.2	.3			
May	87.7	817.8	90	3.9	85.5	2.2	.2		40.0	
Jun	99.3	773.7		6.2	99.3	0	.2		50.0	
Jul	115.7	717.3		7.3	115.7	0	8.9		50.0	
Aug	95.7	651.1		6.1	95.1	0.6	0		50.0	
Sep	72.4	595.0		4.1	72.0	0.4	0		40.0	
Oct	65.6	550.9	90	2.4	48.0	17.6	0			
Nov	30.8	548.5	160	-0.8	24.0	6.8	0			
Dec	28.2	549.3	160	-2.4	24.7	3.5	0			
Total	844.2			27.2	676.8	48.3	28.0		230.0	122.2
Jan	151.0	551.7	160	-1.6	17.1		7.6	1,459		
Feb	315.9	679.6	250	0	15.9		6.9	3,999		222.7
Mar	655.8	750.0	250	0	22.1		.2	5,680		573.5
Apr	322.3	810.0	190	1.9	45.8		.2	3,959		174.4
May	150.5	910.0	90	4.2	99.5		.3	322		
Jun	194.8	956.5		7.0	116.3	78.5	.3		20.0	
Jul	122.3	929.2		8.5	122.1	0.2	11.1		50.0	
Aug	111.1	859.6		7.1	109.7	1.4	0		50.0	
Sep	81.6	802.5		4.9	80.8	0.8	0		35.0	
Oct	56.4	762.6	90	2.8	52.9	3.5	0			
Nov	36.0	759.8	160	-1.0	28.8	7.2	0			
Dec	102.4	760.8	160	-2.8	29.6		0	3,370		26.4
Total	2,300.1			31.0	740.6	91.6	26.6		155.0	997.0

1/ See Tables I-9 and I-10 for mandatory releases. Releases for fishery preservation are based on agreement between Department of Fish and Game and Yuba County Water Agency.

2/ Yuba River flow in excess of local uses (col. 5) which occurs in months of no Delta surplus. Surplus flows in the Delta (col. 8) reflect ultimate (1995) development in the Yuba River valley floor service area.

3/ As recommended by Department of Fish and Game in Appendix B of Bulletin No. 115.

4/ From operation of CVP-SWP under May 16, 1960 agreement and estimated 1995 conditions of consumptive use in the Central Valley.